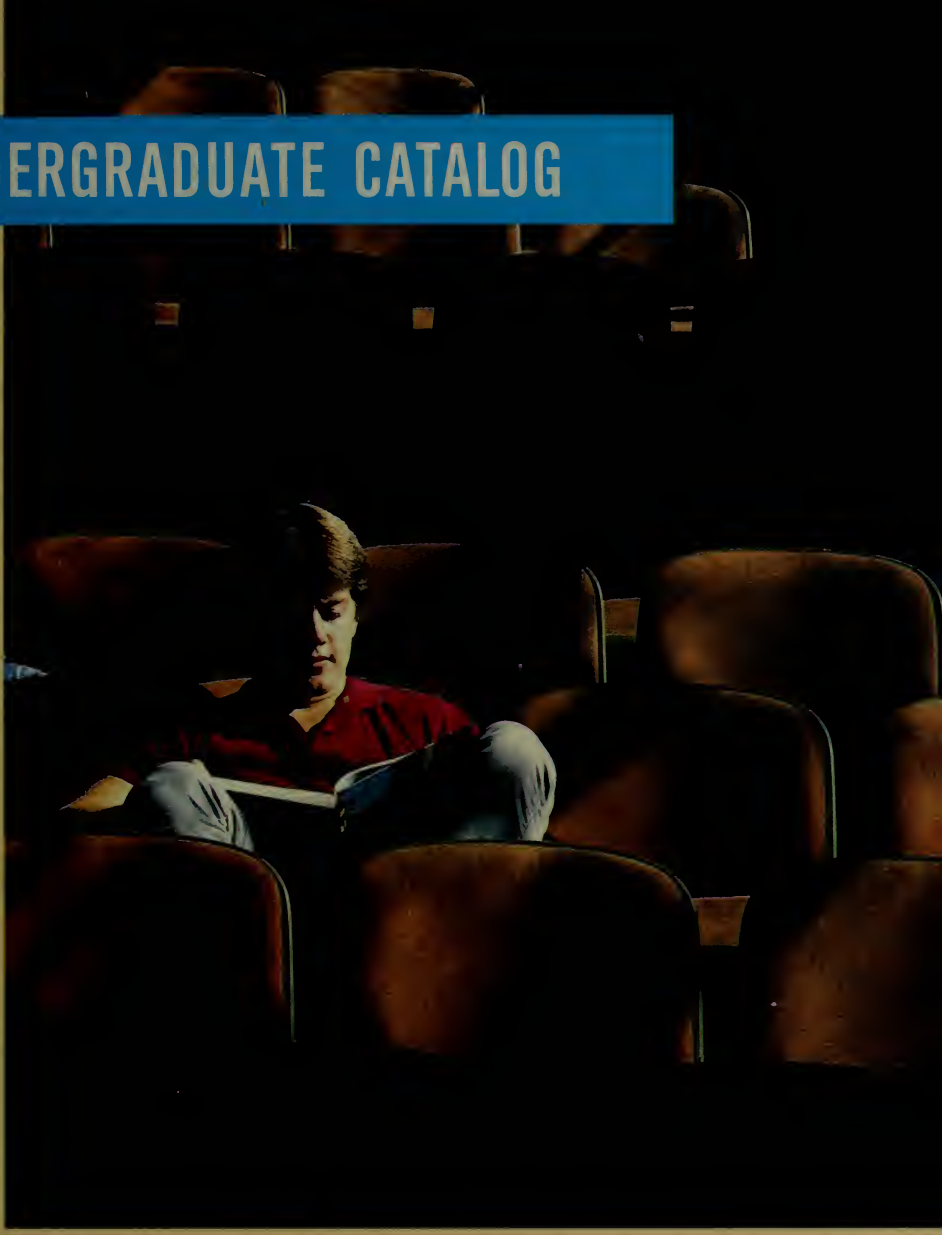
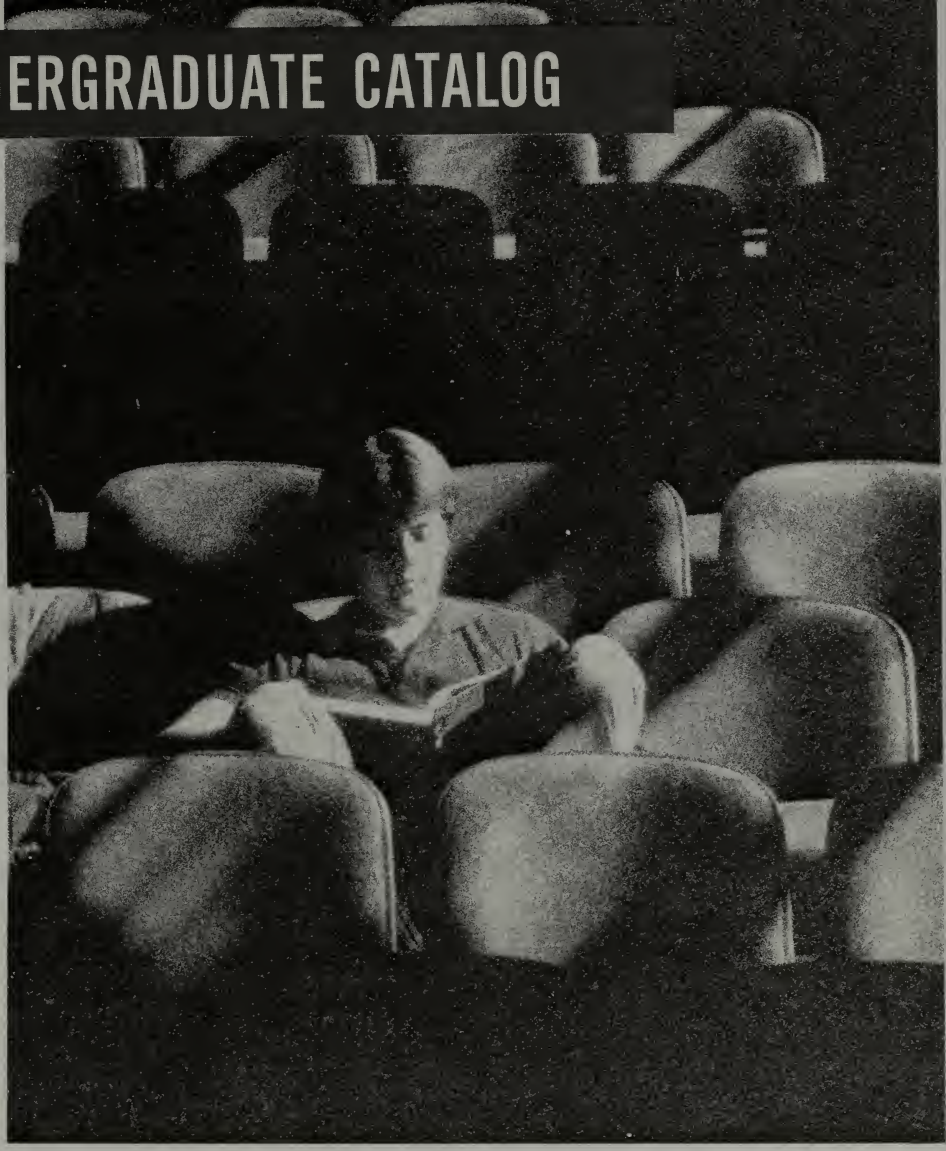
UNDERGRADUATE CATALOG



1987 • 1988

Fitchburg State College

UNDERGRADUATE CATALOG



1987 • 1988

Fitchburg State College

Cover photo by Bob Arnold

How To Use This Catalog

This catalog is a guide to the academic and other requirements you must meet in order to graduate from Fitchburg State College. You should read the introductory sections carefully and discuss any questions you may have with your advisor or the staff of the Advising Center. For specific questions on tuition, grading policy, financial aid, and other non-academic matters, it may be best to visit the appropriate office on campus.

The most important academic use of the catalog is course selection. You must select the courses that meet the requirements of your major and the College's General Education curriculum. Before selecting any courses, read the requirements of your major and then the course descriptions.

After your first week of classes in any course, you should make a decision about continuing in the course. The catalog describes the process of adding and dropping a course and the effect your decision may have on your grade point average and graduation schedule. You should consult the catalog prior to each semester. In your junior year you should review it again to make sure that you are on course to meet all the graduation requirements of your major and the College. Read, consider, discuss, take action. That's how to use the catalog.

The provisions of this catalog are not to be regarded as an irrevocable contract between the College and the students.

Board of Trustees

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Accredited by:
New England Association of Schools and Colleges. National League for Nursing. Council for Standards in Human Service Education.

Approved by:
National Association of State Directors of Teacher Education and Certification. Interstate Certification Compact on Certification of Educational Personnel. State Board of Registration in Nursing.

Member of:
Fitchburg State College is a member of the American Association of Colleges of Teacher Education, the College Entrance Examination Board, the Massachusetts Association of Colleges of Nursing, The American Association of State Colleges and Universities, American Association of University Women, the International Association of Colleges and Universities, the American Council on Education, the New England Association of College Admissions Counselors, the American Association of Collegiate Registrars and Admissions Officers, and the Council of Colleges of Arts and Sciences.

Affirmative Action Policy:
Fitchburg State College maintains its policy of non-discrimination and Affirmative Action in fulfillment of the requirements of Federal Executive Orders 11246 and 11375 as amended; the Civil Rights Act of 1964 as amended; Title IX of the Educational Act of 1972; Section 503 and 504 of the Rehabilitation Act of 1973; Section 402, Vietnam Era Veterans Readjustment Assistance Act of 1974; and pertinent laws, regulations and executive directives of the Board of Regents of Higher Education, the Commonwealth of Massachusetts, and other applicable state and federal statutes. The policy states:

> It is the policy and commitment of Fitchburg State College not to discriminate on the basis of race, religion, color, age, sex, handicap, veteran status, marital status, or national origin in its educational programs, activities, admissions or employment policies and to actively comply with the requirements of Federal Executive Orders 11246 and 11375 as amended; the Civil Rights Act of 1964 as amended; Title IX of the Educational Act of 1972; Section 503 and 504 of the Rehabilitation Act of 1973; Section 402, Vietnam Era Veterans Readjustment Assistance Act of 1974; and pertinent laws, regulations and executive directives of the Boards of Regents of Higher Education, the Commonwealth of Massachusetts and other applicable state and federal statutes.

Inquiries concerning the application of, or compliance with, the laws and regulations prohibiting such discrimination should be addressed to John J. Ciarusso, Director of Personnel/Affirmative Action, who has been designated Title IX Coordinator (Ext. 3172) or with respect to Section 504, Steven J. Lanciani, Director, Facilities (Ext. 3118) who has been designated Coordinator for Section 504, or the Office of the Assistant Secretary for Civil Rights, United States Department of Education, Washington, D.C.

Sexual Harassment Policy:
Sexual harassment is a form of behavior which fundamentally undermines the integrity of academic and employment relationships. It is of particular concern within educational institutions where all members of the community are connected by strong bonds of intellectual interdependence and trust. It is against the policy of the College for any member of the College community, male or female, to harass another employee or student sexually. The College is committed to providing a working and learning environment that is free from all forms of abusive, harassing or coercive conduct. The policy seeks to protect the rights of all members of the College community (faculty/librarians, administrators, staff and students) to be treated with respect and dignity.

Sexual harassment consists of unsolicited verbal, non-verbal, and/or physical conduct which has the effect of interfering with student or employment status or creating an intimidating, hostile or offensive environment.

The College's Affirmative Action Grievance Procedures will serve as a system of review and resolution for both informal and formal complaints. Further information or advice may be obtained by contacting Terrance J. Carroll, assistant to the President, Ext. 3172.

Privacy and Confidentiality Regulations:
Privacy and Confidentiality regulations pursuant to the Fair Information Practices Act—F.I.P.A-(Chapter 766 of the Acts of 1965) are posted, together with a copy of the Chapter 766 and the name of the F.I.P.A. administrator on appropriate bulletin boards at the College. They may also be examined at the Registrar's Office.

Students should note that if any of these regulations should conflict with applicable provisions of the federal Privacy Act of 1974, as amended or of any regulations promulgated pursuant to said act, the provisions of said federal act or federal regulations shall control.

Waiver of Academic Regulations
Recognizing the inappropriateness of rigidity in endeavors to promote its goals, the College provides for waiver procedure relative to its baccalaurate rules, regulations and programs. All Petitions for waiver of regulations begin with the Office of the Undergraduate Dean. The student should note that reasons for waiver must be as exceptional as the grant.

To The College Community:

Fitchburg State College was founded in 1894 as a normal school for teacher education. Today, you will discover it is a comprehensive public college that gives you a low-cost, flexible opportunity to study those programs and subjects which interest you.

As a public institution, our history has been one of innovation and growth in career education. You will find us dedicated to maintaining an attractive environment for learning — from state-of-the-art equipment to well-kept grounds and facilities. You will find here an efficient administration that keeps college costs within your reach.

You will, however, grow to love these attributes only as a pleasant background to your educational achievement. Ultimately, your attachment to FSC will be forged by our faculty. They are among the best in higher education. They bring to their classrooms broad and specialized knowledge of their fields and much practical experience. Most importantly, they are a teaching faculty, committed to helping you acquire the knowledge and skills you will need for success in your careers.

Vincent J. Mara, Ph.D.
President

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HOLMES
DINING
COMMONS

The Academic Calendar 1987-1988

Fall, 1987

Sept.	7	Monday	Residence halls open for all students—12 noon
	8	Tuesday	President's address to faculty-10:00 am followed by department meetings and student advising
	9	Wednesday	Classes begin 8:30 am
	22	Tuesday	Final day for dropping/adding courses
	24	Thursday	Fall Academic Convocation-1:30-2:30 pm
Oct	6	Tuesday	Final day for making up Incomplete Grades from previous semester
	8	Thursday	U.S. & Mass. Constitution Examination
	12	Monday	Columbus Day-NO CLASSES
Nov.	4	Wednesday	Final Day for withdrawal from classes without penalty
	11	Wednesday	Veteran's Day-NO CLASSES
	12	Thursday	U.S. & Mass. Constitution Examination
	25	Wednesday	Thanksgiving recess begins 3:30 pm; Residence halls close 5:00 pm
	29	Sunday	Thanksgiving recess ends; Residence halls reopen 3:00 pm
Dec.	11	Friday	Last day of Fall Semester classes
	14-23		Final Semester Examinations

Spring 1988

Jan.	18	Monday	Martin Luther King Day-NO CLASSES Residence halls open for all students 3:00 pm
	19	Tuesday	Department meetings and student advising
	20	Wednesday	Classes begin 8:30 am
Feb.	2	Tuesday	Last day for adding/dropping courses
	15	Monday	U.S. Presidents' Day-NO CLASSES
	17	Wednesday	Final day for making up Incomplete Grades from previous semester
	18	Thursday	U.S. & Mass. Constitution Examination
March	11	Friday	Spring vacation begins 4:30 pm Residence halls close 6:00 pm
	20	Sunday	Spring vacation ends; Residence halls open 12:00 noon
	23	Wednesday	Final day for withdrawal from classes without penalty
April	18	Monday	Patriots' Day-NO CLASSES
	19	Tuesday	All-College Development Day (Tentative)
	28	Thursday	Honors Convocation; afternoon classes suspended 1:30 pm
May	6	Friday	Last day of spring semester classes
	9-20		Final semester examinations
	29	Sunday	Commencement 10:30 am Campus Quadrangle

The College

The academic programs at Fitchburg State College combine a traditional foundation in the liberal arts with progressive, practical, professional majors. Students are challenged to discover the whole person, to develop themselves intellectually, physically, socially and spiritually. "The Fitchburg commitment" means learning to love life and to contribute to it in a useful, memorable fashion. There is no greater goal.

Fitchburg State College is the largest four-year undergraduate college in Central Massachusetts. Its intimate, attractive campus, enthusiastic students, and tradition of opportunity and excellence are known throughout the Commonwealth. Each year businesses and organizations, familiar with the quality of a Fitchburg State College education, seek out Fitchburg students as candidates for practical internship experience and employment after graduation. This link between the college and the community makes Fitchburg State important to the region, but ultimately it is the character of its people which makes it most special.

Founded in 1894 as a Normal School, Fitchburg State College is, today, a medium-sized public institution serving the varied educational needs of the state and region. In addition, it offers its students and other adult learners an opportunity for Graduate and Continuing Education that is compatible with its undergraduate program.

History of the College

The State Normal School in Fitchburg was established in 1894 by an act of the Massachusetts legislature and opened in temporary quarters in the old high school building on Academy Street. Principal John G. Thompson was aided by three teachers, 200 books, and an $11,500 budget for the education of 46 women in a two-year program. In December, 1896, the school moved into its new building and took charge of the Day Street and Highland Avenue city buildings as state schools of observation and practice.

Several years later the Edgerly School was opened as an eighth grade model and practice school, and in 1910 it became one of the first junior high schools in the United States. The following year a Practical Arts teacher training course for men, the first of its kind in the country, was instituted. The new course assisted in increasing male enrollment.

In 1930, the State Normal School was authorized to offer a bachelor's degree in Practical Arts, and in 1931, when it became the State Teachers College at Fitchburg, four-year degrees were offered in all levels of Education. Formal graduate courses were first offered in 1937.

In 1960, the college became the State College at Fitchburg and was empowered to award additional degrees. In 1965, the name was officially changed to Fitchburg State College. Over the decades many departments were added to the existing education departments, and by 1985 Fitchburg State College was offering thirty-two programs in eighteen academic departments to its 3,700 full-time students and 2,700 part-time students. The campus now has 93 acres and 23 buildings.

Principles of the College

The college fulfills its mission of public service by striving for excellence in four specific ways:

Dedication to Career Education

The college aims to assist students in identifying their goals and in deciding upon their careers. To attain this goal the college strives:

To prepare students to meet the needs of society through careers in teaching, nursing, medical technology, human services, business and industry, and government, among others;

To provide programs preparing students for these careers, including programs dedicated to new and emerging career fields;

To provide choices and opportunities, including field experience, which aid students in securing employment;

To provide additional training opportunities intended to improve the knowledge and skills of persons already holding jobs.

Dedication to the Development of the Student

The intellectual, esthetic, and moral development of students during their college years demands the presence on campus of an attitude or climate suitable to the attainment of this goal. Therefore, the college aims:

To develop a spirit of commitment to learning by stressing high standards of intellectual performance, by encouraging scholarly research, by developing the ability to analyze and synthesize knowledge from a variety of sources, and by communicating the conviction that learning is a life-long process;

To enable students to acquire knowledge in areas such as the Humanities, Social Sciences, Physical Sciences, Biological Sciences and Mathematics as well as a depth of knowledge in at least one academic discipline and/or interdisciplinary studies;

To strive for moral development which requires reflection and commitment to ethical principles as a guide for personal conduct, as a basis for self-esteem, and as an aid to learning respect for others;

To assist students to recognize the great moral issues of our time, develop respect for all peoples, seek improvement in the quality of life by examining environmental and social problems and other relevant issues of the day;

To establish those conditions which are conducive to an esthetic environment by involving students, faculty, and administrators in the determination and promotion of cultural activities.

Dedication to the Montachusett Community

The College must acknowledge some responsibility for its effect upon the local, regional, state and national communities. To this end it aims:

To serve as a cultural and intellectual center for these communities;

To cooperate with the efforts of local, regional, state and federal agencies to solve-within the local community, the region, the state, and even the nation, social, economic or governmental problems;

To provide for continuing adult education;

To facilitate student involvement in neighborhood and community service activities;

To make the most efficient and effective use of the human, natural and material resources provided by area communities.

Dedication to the College Community

A paramount objective of Fitchburg State College is the promotion of the welfare of the entire college community. To this end the college endeavors:

To systematically evaluate programs, policies, practices, and all the members of the College community, as well as to assess, regularly, needs outlined in short, medium, and long-range planning;

To recognize and respect the rights and responsibilities of all members of the college community;

To establish and maintain well-defined and open channels of communication throughout the structure of the college;

To maintain a clearly defined system of governance which calls for participation by representatives of students, faculty and administrators;

To encourage individuals in their search for truths and in the honest consideration of ideas, both in the classroom and in communications with all members of the college community.

Graduate and Continuing Education

The Division of Graduate and Continuing Education offers graduate and undergraduate degree programs and courses in keeping with its purpose of providing educational opportunities for professional and scholarly advancement for the people of central New England. The programs serve the lifelong learners seeking career advancement or change, information, or professional or personal growth.

On the Graduate level, the Division offers: Master of Education Degrees in Special Education, Elementary Education, Arts in Education, Educational Technology, Science Education, Occupational Education and Educational Leadership and Management.

The Master of Arts in Teaching degree in English, Master of Science Degrees in Computer Sciences, Communications/Media, Counseling, and Management.

The Continuing Education Undergraduate section offers programs of study leading to B.S. degrees in Business Administration with majors in Accounting, Marketing, Management, Vocational Education, and Computer Science.

Inquiries concerning admission and registration procedures for graduate and undergraduate programs may be addressed to the Dean of Graduate and Continuing Education, Sanders Administration Building.

Degrees Offered

Fitchburg State College is empowered by the Board of Regents of Massachusetts Public Higher Education to offer the degrees of Bachelor of Arts, Bachelor of Science, Bachelor of Science in Education, and several master's degrees.

Bachelor of Arts.
The degree of Bachelor of Arts is offered in the following fields: Biology, Chemistry, English, Geography, History, Mathematics, Psychology, Sociology.

Bachelor of Science.
The degree of Bachelor of Science is offered in the following fields: Biology, Business Administration, Chemistry, Communications-Media, Computer Science, Economics, Geography, History, Human Services, Industrial Science, Mathematics, Medical Technology, Nursing, Psychology, Sociology.

Bachelor of Science in Education.
The degree of Bachelor of Science in Education is offered in the following fields: Biology, Early Childhood, Elementary, English, Geography, History, Industrial Arts, Mathematics, Special Education, Vocational Education (Continuing Education only).

Master of Arts
The degree of Master of Arts in Teaching English is offered.

Master of Education.
The degree of Master of Education is offered in the following areas of specialization: Arts in Education, Elementary Education, Occupational Education, Educational Leadership and Management, Educational Technology, Science Education, Special Education. Further information regarding these programs may be obtained through the Office of Graduate and Continuing Education.

Master of Science.
The degree of Master of Science is offered in the following areas of specialization: Communications/Media, Computer Science, Counseling, Management. Further information regarding these programs may be obtained through the Office of Graduate and Continuing Education.

Graduate Programs

The Graduate Division offers programs of study leading to the following graduate degrees:

Master of Arts in Teaching (English)

Master of Education

Concentrations In:
Arts in Education
Educational Leadership and Management
Educational Technology
Elementary Education
Occupational Education
Science Education
Special Education
- Generic Consulting Teacher
- Teacher of Children with Moderate Special Needs
- Teacher of Children with Severe Special Needs
- Teacher of Young Children (3-7 yrs) with Special Needs

Master of Science
Communications/Media
Computer Science
Counseling
  School Counseling
  Community Counseling
Management

Certificate of Advanced Graduate Study/Career Education

Certificate in Educational Technology

Certificate in Computer Aided Manufacturing

Fine Arts Director Certificate Program

Senior Level—Graduate Credit Policy

Senior Level Student (90 S.H. or more), with a 3.5 or better Q.P.A. may, with approval of the Graduate Dean or his Designee, register for Graduate Credit courses at the 900 level as long as the combined Graduate and Undergraduate credit load in a Semester is not more than 15 hours. A maximum of three Graduate credits may be taken in a semester. The student must submit the recommendation of the appropriate Undergraduate Advisor and the Registrar, to the Graduate Dean for approval. No more than nine (9) semester hours of Graduate credit may be accumulated by a Senior, and those Graduate credits may be applied by students to maintain full-time status to receive Financial Aid.

Servicemembers Opportunity College

Fitchburg State College is a fully approved SOC member. The designation reaffirms the College's commitment to serving the voluntary higher education needs of the military student. The SOC principles and criteria subscribed to by all member universities provide the basis for a consistent and uniform approach to meeting the special needs of military personnel. The Associate Registrar of the College serves as the Counselor for this important program.

The Curriculum

Each curriculum or program of study provides students with a regulated and structured framework for developing the intellectual skills needed to analyze, to interpret, and to learn from the accumulated knowledge of the past. This framework assists students in recognizing the opportunities as well as the problems of their changing world. It encourages in students a moral awareness of their responsibilities toward maintaining and improving the quality of human life and prepares them for careers which will furnish their lives with meaning and self respect.

The curriculum includes a set of required general education courses, 14 general education courses distributed among the liberal arts disciplines, and courses in the major field of study. The purpose of the general education requirements is to provide Fitchburg students with specific communication skills along with the breadth of knowledge which is earned through the study of many different disciplines. Through study in the major field, students accrue the intellectual benefits of depth of understanding and knowledge in one field. Many of the major programs of the College include a senior year internship or some other form of practical educational experience.

Common Graduation Requirements

The candidate must successfully complete a program including: General Education, a Major, and a minimum of 120 Semester Hours: more hours may be required, depending on major.

The candidate must attain 45 Semester Hours in residence; normally, these will include the Senior year.

Candidates for teacher certification must satisfy the Constitution requirement of the Commonwealth of Massachuetts. This requirement calls for knowledge of the Federal Constitution and that of the Commonwealth. It may be fulfilled in either of two ways:

Passing a written examination on these constitutions. The exam, administered by the Social Science Department, is offered at least three times a year; there are no limits as to frequency of taking. A pamphlet on the exam and a study guide may be obtained from the College Bookstore.

Successful completion of one of the following courses:

HI 210-U.S. History I
HI 220-U.S. History II
PS 100-Modern American Government: State & Urban
PS 200-Modern American Government: The Federal Government
PS 220-Constitutional Law and the Supreme Court

The candidate must attain at least a 2.0 cumulative average in her/his Major and a 2.0 overall cumulative average.

Candidates for graduation must file an application, no later than February 1 of the year of anticipated graduation, with the Registrar. See the Registrar for the appropriate form.

General Education

An Overview

Required Courses	*Credits*	*Liberal Fields Distribution*	*Credits*
**Basic Math I*			
**Basic Math II*			
**Basic College Writing*			
English Composition I and II	*6*	*Math/Science (4 courses)*	*12-16*
Speech (not required for		*Social Science (5 courses)*	*15*
all majors)	*3*	*Humanities (5 courses)*	*15*
Health and Fitness	*3*		
Constitution Proficiency	*0*		
(Teacher Education Majors)		***General Education Electives***	***6***
		Total	***60-64***

*Required of new students determined by the Mathematics and English Departments to have deficiencies in writing and mathematics upon entrance to the College. Each course counts for 3 semester hours of Institutional Credit only, not toward the baccalaureate. See, "Remediation Program" for further information.

Remediation Program

All students, including transfers, will be tested or otherwise evaluated, upon entrance to Fitchburg State College for deficiencies in writing and mathematics and, if found deficient, will be subject to the following requirements: Freshmen students will take up to three remedial courses—Basic Math I and/or Basic Math II and Basic College Writing.

Transfer students who fail the English exam will be required to take Basic College Writing if they have no transfer credit in Composition. If they do have such credit, they will be required to register for the Writing Skills Workshop, either before registering for Comp. II or as a condition of graduation. Transfer students who fail the mathematics exam will not be required to take Basic Math I or II unless they

wish or are required to take a mathematics course at the 100-level or above. They will not be allowed to register for a 100-level or above math course until their deficiencies are remediated. These courses will be for Institutional Credit only; that is, they will not count toward graduation but will count toward full-time status for purposes of financial aid and athletic eligibility. The grade will count in the student's grade point average.

Required Courses

*Basic Math I and II *Basic College Writing: Basic Math I and II and Basic College Writing are remedial courses offering Institutional Credit only. They do not count toward the minimum 120 semester hours required for graduation.

English Composition: EN 100 and EN 120

Speech: There are several courses in addition to Introduction to Speech Communications which satisfy the requirements. See the Speech section of "Courses and Programs . . ." (Speech is not required of all majors).

Health and Fitness: There are many choices available to satisfy the requirement. See the Physical Education section of "Courses and Programs . . ."

Liberal Fields Distribution

Math/Science

This distribution requirement may be met by taking four courses, no more than two in the same field. Options include the fields of Biology, Chemistry, Computer Science, Geology, Mathematics, and Physics. For identification of courses available to meet General Education requirements, refer to these fields as listed in, "Courses and Programs . . ." Note particularly any prerequisites.

Social Sciences

This distribution requirement may be met by taking five courses, no more than two in the same field. Options include the fields of Economics, Geography, History, Political Science, Psychology, Sociology. For identification of courses available to meet General Education requirements, refer to these fields as listed in "Courses and Programs . . ." Note particularly any prerequisites.

Humanities

This distribution requirement may be met by taking five courses, no more than two in the same field. Options include the fields of Art, Literature, Languages (French, German, Spanish, Russian), Music, Philosophy, Speech. For identification of courses available to meet General Education requirements, refer to these fields as listed in "Courses and Programs . . ." Note particularly any prerequisites.

General Education Electives

Choice limited by exclusion of professional career courses in the following programs: Business Administration, Communications/Media, Education, Human Services, Industrial Technology, Military Science, and Nursing. For identification of courses available to meet General Education requirements, refer to these fields as listed in "Courses and Programs . . .

Restrictions

No more than eight credits in any one field may be used to satisfy the General Education distribution requirements.

No division of credits earned in one course is allowed.

Four semester-long courses must be taken to satisfy the Math/Science requirement, hence the anomaly, 12-16 Semester Hours.

Courses used to satisfy General Education requirements may also fulfill Major prerequisites; however, the credits earned towards graduation can not be counted twice.

The various degree programs and Majors specify, in many cases, which of the options must be taken. See, "Courses and Programs . . ."

The Major

The major programs have various requirements in both course work and credits. They range from 33 to 63 credits in length and have requirements in General Education courses as well as the specific major field. The requirements of the Majors constitute a complexity that forbids significant summarization. For details of requirements and options, see, "Courses and Programs . . ."

Enrollment in a given Major is a formal process. Most students are accepted into a major program upon admission to the College. Other students apply for acceptance to a major after their matriculation. These students must file an application with the Registrar. Some students remain as Undeclared Students through their Sophomore year. They are encouraged to apply for transfer to the major of their choice as early as possible in their college career. Application forms for most majors are available in the Academic Advising Center or from the chair of the individual department.

The Minor

Students are encouraged to study in one or more fields in addition to their major field of study. They may study toward one of the minors offered at the College. The requirements of these minors vary in number of credits and prerequisites although the minimum number of credits for any minor is 15. The requirements for each minor may be found under the individual discipline in the section, "Courses and Programs." A brochure describing the requirements of all minors is available in the Registrar's Office and the Academic Advising Center. Some minors have limited enrollments. Specific application to the Department concerned is required, and declaration of the Minor commitment should be filed with the Registrar. Minors are offered in Art, Biology, Business Administration, Chemistry, Computer Science, Economics, English, Elementary Education, Foreign Languages (French, German, Spanish), Geography, History, Industrial Science, Interdisciplinary Graphics, Irish Studies, Mathematics, Music, Philosophy, Physical Education, Psychology, Russian Studies, Secondary Education, Sociology, Theatre.

Electives

Degree Program variations make for differences in the number of credits prescribed for the career specialization. There is room for Electives when all General Education and Major requirements have been met and the student is still short of the 120 credits required for graduation. These courses may be selected from any discipline.

Special Academic Programs

Internships and Practica

Many major departments offer intensive training programs involving work-study or field work. Student interns are supervised by professors and on-site coordinators. The internship program is available to many upper class students as a part of their major or minor programs of study. Field sites are available in businesses, industries, schools, social service agencies, newspapers, television stations and hospitals.

Acceptance into the internship program is competitive in some majors, such as Business Administration, and is a required part of other major programs such as Communications Media. Students earn from three to 15 credits for their internship work. Students earning three credits work for at least nine hours per week at their placement and those earning 15 credits work for at least 45 hours per week.

Some programs require liability insurance of all students enrolled in field-based or clinical courses and courses with practicum experiences. See specific requirements of individual programs.

Business Administration Internship

The Business Administration Department offers its students the opportunity for experiential learning through its Internship Program. The internship is a one-semester experience that occurs in either the second semester of the Junior year or the first semester of the Senior year. Students are placed on jobs that relate to their area of concentration. While the student is working at a host company he/she earns a full semester of credit. In addition to working at the host company, the student is required to attend an internship seminar on campus once every two weeks. In order to participate in the Internship Program, a student must have a 3.0 average in business courses and a minimum of 2.5 overall cumulative average.

The Internship Program is structured to give the participant an opportunity to apply the theory of the classroom to a "real world" experience. The Internship Program enhances the students' total college experience.

Communications Media Internship

The Communications Media practicum, both the on and off-campus experience, is the culmination of the Communications Media major. Students, in the last semester of their senior year, are placed with business, industry, health services, governmental agencies, educational institutions and public organizations. The practicum experience provides each student with the opportunity to apply the knowledge and skills acquired during his/her course of study to the solution of a practical communications problem at the internship site.

Each practicum involves working under the professional supervision of the agency as well as the Department's faculty. The 12-credit hour practicum requires students to spend at least 15 36-hour weeks at their internship site. The 6-credit hour practicum requires 15 18-hour weeks of work at the internship site. In addition, a seminar is held one day and/or evening each month at the College for the purpose of sharing ideas and solving problems.

Participation in either the 6 or 12-credit hour practicum is a requirement for completion of the Communications Media major and subsequent graduation from the college.

English Department Internship

The English Department, through its internship program, offers an opportunity for seniors and second-semester juniors to explore a profession for one full semester of work and credit. English majors can experience a wide range of professional activity in fields such as radio, television, journalism, personnel work, library functions (school, public, or technical), public relations, law, government, human services, and technical publications.

New internship positions are identified each semester. The program has provided an unusually high level of job-entry success for those participating. The internship enables students to apply theoretical knowledge and laboratory-developed skills in an actual professional setting. Department approval is required.

Field Work in the Human Services

The Human Services program cordinates supervised field work experience with class work. The field work involves working in an agency under professional supervision either 18 hours a week throughout the academic year or 36 hours a week for a full semester. In addition, all students in the class meet to share experiences and learn about other agencies.

Students have been placed in probation offices, mental health facilities, family and children's agencies, hospitals, nursing homes, special needs centers, welfare offices, recreational settings, etc. These experiences should strengthen the position of students when applying for a job, give them a more realistic basis for choosing a career and give their potential employers an opportunity to screen students as job candidates.

Integrated Creative Arts Teacher Education Program

This is a full-semester experience which includes six weeks of classroom instruction and training (creative work in visual arts, language arts, movement, music, integrating art forms and classroom management). Subsequently, students will be placed in field stations for classroom experiences for the remainder of the semester. These activities will involve assisting teacher-specialists in one or more of the art form areas, and developing and implementing programs for the specific classroom and its pupils to foster the pupils' personal expression through creation in the art.

Intermittent seminars will be held one day a week at the College for the purposes of sharing workshop experiences and problem solving. Students are ordinarily expected to be present in the schools on a fulltime basis throughout the semester. They will be visited and evaluated by college faculty as well as by cooperating teacher-specialists in the schools.

Integrated Professional Program

The Integrated Professional Program in the Department of Special Education is a program that moves the preparation of special educators from a college-based program to elementary schools in the community. In this setting, students have theoretical, observational, and participatory experiences. When a concept or technique is introduced academically, the students have the opportunity to observe a demonstration in the classroom and to engage in a teaching practice. The College faculty provide guidance, immediate feedback and further demonstrations. The cooperating practitioner also participates in this experience with the students. The students raise questions based on their academic and participatory experiences and share ideas, problems and learning with other professionals.

This program prepares teachers to meet the educational needs of students who manifest learning behavior problems in the regular elementary classroom environment.

The college student spends three weeks, 6 hours a day, in an orientation program on campus for course content followed by 6 hours of seminar per week on campus for additional course content, 3-4 hours per day on site at an elementary school for prepracticum experiences; and 7 weeks at the same elementary school in an elementary teaching experience on a full-day basis. This practicum is Student Teaching Level I.

Legal Internship

The Legal Internship Program is a one-semester, 12 credit-hour practicum designed to introduce students to basic legal concepts and research tools. A legal intern under faculty and attorney supervision in a law office deals at first hand with the problems of clients. Attention is given to fact-investigation, legal research, and the preparation of motions, pleadings, trial memoranda and appellate briefs. The internship entails a minimum of 36 hours per week in the office. The offices handle criminal cases and a wide range of civil matters including consumer, administrative, family, welfare, matrimonial and civil rights cases. Enrollment is limited.

Internships in Political Science

Off-campus opportunities, carrying appropriate academic credit, are available in local, state, and federal government offices and with political campaigns. Students gain an insight into the workings of government administration and politics under the supervision of a political science instructor. Internships are also available in several regional law offices for those persons interested in para-legal work. These internships prepare students for positions in law offices, public administration, and other human service work. Students normally take this legal internship in their junior or senior year. Credit is for either six or twelve semester hours depending upon arrangements with the Social Science Department.

Internships in Psychology

The Psychology faculty offers an opportunity for the advanced student to perform extensive work in an agency or placement providing psychologically related services. Supervision for the students work will be provided by both departmental and agency personnel. Students participating in an internship meet weekly as a group to share experiences and provide maximum exposure to the various placement opportunities available.

Internship in Sociology
The advanced sociology student (i.e., junior or senior) may elect the opportunity to gain direct working experience in a setting providing sociologically related services. The student will be supervised by both departmental and agency personnel and may choose an internship experience providing 6 to 12 credits. Students participating in such internships meet weekly as a group to share experiences and to provide maximum exposure to the various placements opportunities available.

Selective Practicum in Nursing
Senior nursing faculty arrange individualized placements in a variety of clinical settings with a qualified registered nurse preceptor for 12 hours a week over two semesters or 24 hours a week in spring semester, for the culminating nursing requirement. Students have concurrent class work, a paper related to a major project, and seminars weekly to share experiences and concerns. The experience offers an opportunity to solidify their skill acquisition, explore career options and expand knowledge of nursing in a particular specialty or setting.

The Honors Program

The Honors Program is a coordinated four-year program offering an enriched curriculum for the most academically-able Fitchburg students. Frehman students are invited to join the Honors Program based on their high school grades and preparation, SAT scores, and references from secondary teachers. Sophomore and junior students are invited to join if they have a cumulative average of 3.4 or better. (See "The Honors Program" under "Courses and Programs in the College" for more information.)

AID Program (Alternatives for Individual Development)

The Alternatives for Individual Development program (A.I.D.) is designed for students who possess the motivation and academic potential to receive a college education but have been denied access because of cultural, economic and/or educational disadvantage. The paramount focus of the program is the education and graduation of its students.

Potential students must meet certain qualifications: for example, they must be residents of Massachusetts, and must meet other criteria such as attendance at an urban school, participation in METCO or Upward Bound programs, and/or receipt of public financial assistance. Potential students apply to the college through the Admissions Office, indicating on their application their interest in the A.I.D. program. An A.I.D. application, personal statement, interview, and recommendations are required. Applicants also take evaluative tests to determine appropriate course placement.

Students admitted into the program and the college receive supportive services in developmental reading, writing, mathematics and study skills. Tutoring is available in a wide variety of academic subjects. The tutors who work with the A.I.D. program are selected from among the highest achieving, most caring students at Fitchburg State College. A.I.D. staff maintain an open-door policy for academic counseling and advising. Through referrals, the staff involve students with many other college faculty and counselors in order to provide the best answers to student questions and concerns.

Army ROTC

The Military Science curriculum provides an opportunity for qualified students to earn a commission as an officer in the United States Army, Army National Guard or Army Reserve. The military instruction is integrated into the academic major of the students choice. The skills and professional knowledge taught prepare a student to serve the military or business in a leadership role.

The program of instruction is organized into a Basic Course (first two years) and an Advanced Course (last two years). The Basic Course strives to introduce the Army to the student. No military obligation is incurred. The Advanced Course develops those students who have chosen to continue with military studies into commissioned officers. The program is sufficiently flexible to be tailored to individual students' needs and qualifications. Advance Course graduates may serve their military obligation in the Active Army or in their local communities as a member of the National Guard or Army Reserve.

Military instruction includes theory developed in the classroom and hands-on practical applications. Academic studies concentrate on leadership, management and technical skills. Adventure-oriented training and other field activities complement the classroom material. A special nursing program is also available.

A variety of scholarship and other financial assistance programs is available. Detailed information may be found in the financial aid portion of this catalog.

Beyond the Classroom: Student Life

At Fitchburg State College, human development extends beyond the classroom and into the total campus environment. The college offers a variety of avenues for self-discovery and expression. It encourages growth-emotional, social, cultural, physical and spiritual-through co-curricular activities.

Fitchburg State students who accept new commitments and added responsibilities and those who choose to become active in campus life find opportunities to establish confident career paths. Often Fitchburg students develop significant, helpful and long-lasting relationships with college faculty, administrators and other students.

Student Rights and Responsibilities

The philosophy behind the Student Judicial System at Fitchburg State College is that student conduct is a personal responsibility. The Student Judicial Code was developed as a cooperative effort among students, faculty, and staff in order to provide a comprehensive listing of College regulations and sanctions and to establish fair processes for dealing with instances of student misconduct. The central focus of the Judical System is the Student Judicial Board, which is administered by the Student Government Association in conjunction with the Office of Student Affairs.

College regulations apply on campus and at college-sponsored affairs wherever they may take place. They include federal, state, and local laws as well as rules and regulations conducive to the attainment of the goals of the College. The following list, not an exhaustive one, gives examples of areas covered by the regulations: academic honesty, false representation; tampering with college

records, theft, vandalism or intentional destruction of college property; harassment; physical assaults; possession or consumption of alcoholic beverages or drugs in violation of College guidelines; false alarms; and the possesion or use of firearms.

The complete text of the Student Judicial Code is available in the Student Handbook or from the Student Affairs or Student Government Association Offices.

A student on Disciplinary Probation, Suspension or Expulsion will not be allowed to serve on campus representative committees, hold elected office or appointed campus wide office, or be a member of any intercollegiate athletic team, nor shall he/she be eligible to apply for campus based financial aid during the second semester of a two-semester probation.

Residence Life

Residence Halls

Three campus residence halls and an apartment complex provide housing for more than eleven hundred students while Fitchburg State College is in session. All residence halls are conveniently located within easy walking distance of classrooms, offices, and other centers of student activity on the campus. Holmes Dining Commons is situated adjacent to the residence halls, and provides meals for all residence hall students as well as many students who live off campus.

Aubuchon Hall is a highrise with ten residential floors, each designed for forty or more people in double and triple rooms. Study rooms and recreational facilties are provided on the first floor. Russell Towers, which opened in the fall of 1971, has thirty-six suites, arranged with a dozen suites in each of three towers. "Family Style" living is enhanced through the inclusion of a living room and kitchenette in each suite. Herlihy Hall, which was extensively renovated in 1977, is the smallest residence with only one hundred and forty-two students on three floors. The town-house style apartment complex provides an additional life style choice for students.

Accommodations for handicapped students are located in the town-house apartments, as well as in Aubuchon Hall and Russell Towers.

Most residence hall rooms are double rooms. The number of single rooms available is very limited. Larger rooms accommodate three or four residents. All rooms are equipped with basic furnishings such as bed, dresser, desk and chair. Students must provide their own linen, towels, study lamps, and mattress pad or cover.

Residence Halls are much more than places to sleep. These living centers form a major focal point of campus activity, largely through the efforts of the hall councils and the residence staff. The hall council in each building is comprised of elected representatives of the residents and works to plan activities and promote student interests. All four residence halls also have student and full-time professional residence staff who work to assist students with their personal and social needs.

Residence hall space is extremely limited. Students desiring housing are advised to apply for admission with housing well in advance of the deadline for admission to the college. Questions concerning on-campus Housing should be directed to the Residence Life Office, Aubuchon Hall.

Off-Campus Housing

Over two-thirds of the students at Fitchburg State College do not live in the residence halls. A large number live in apartments and rooming-houses in the campus area. The off-campus housing coordinator maintains a listing of available off-campus housing and offers assistance to students who wish to share apartments with other students. The off-campus housing office is located in Aubuchon Hall.

The campus area is convenient to supermarkets, laundry facilities, and shopping. Many students find the off-campus life-style attractive because it affords them the opportunity for increased independence in managing their day-to-day affairs. This "real world" experience helps to prepare them for their post-college life. Off-campus students participate in all campus activities and have their own governing body, the Commuter's Board.

Students who wish off-campus housing asssistance or information should contact the Residence Life Office.

Student Government Association

The purpose of the Student Government Association (S.G.A.) as set forth in its constitution is:

"... to encourage responsibility and cooperation in democratic self-government; to form an official body for expressing the judgments of students and fostering the activities and matters of general student interest; to promote full understanding and cooperation among students, faculty, and administration in order to further the welfare of the college."

All students enrolled as full-time undergraduates are members of the Student Government Association, by virtue of having paid the "Activity Fee." The governing body of S.G.A. is the S.G.A. Council, which is composed of an Executive Board, a Commuters Board, residence hall presidents and vice-presidents, and the presidents, vice-presidents, and four representatives from each of the classes. Elections are held every spring and freshman elections are held in the fall.

The S.G.A. is the official voice of the students and participates in campus-wide committees, state and national student organizations, in addition to participation in its own standing and ad-hoc committees. Participation at any level is welcome and encouraged. The S.G.A. also offers a number of services for its members, including programming, photocopying, and legal advice.

Religious Life

Fitchburg State College students may participate in the services of the many churches, religious congregations and synagogues which are within walking distance of the campus as well as the Newman Center Student Parish which is adjacent to the College. This modern Center, built with the help of Industrial Arts students from the college, provides a spiritual and social gathering place for many students and accomodates various campus events.

Musical Activities

Many opportunities exist for musical performance at Fitchburg State College. The college has a fine 60-piece Concert Band that performs music of all types, ranging from transcriptions of ciassics to contemporary sounds. The Jazz-Rock Ensemble features big band jazz, rock, and experimental music for stage bands. Small ensemble participation opportunities exist as instrumentalists are available. Smaller groups have included brass, woodwind, and recorder ensembles. For vocalists, the FSC Choir offers the chance to sing a wide variety of mixed-voice choral music.

Educational, Cultural and Social Programs

Campus Center

The Campus Center is a haven for commuter and resident students alike who identify with the building as a unifying force on the Fitchburg State campus. The Campus Center is designed, organized and administered to meet the co-curricular needs of the College community as well as to foster and promote community spirit. Its goals are to maximize the opportunities for human

development, provide educational, social, cultural and recreational experiences for the College community, and provide convenient, economical and satisfactory services to the maximum number of the College community.

The facilities include: an information center, art gallery, recreation room, bookstore, craft center, student offices, meeting rooms, post office, vending services, cafeteria, pub and office of the Alumni Association. All facilities are specially designed for handicapped access. Some programs and services generated from Campus Center funds are: a weekly calendar of campus activities, special events, mini courses from crafts to disco, demonstrations, recreation tournaments, films, lecturers, video taped entertainment, performing arts, free use of outdoor recreation equipment, and visual art exhibitions.

The Campus Center Resource Office (CCRO) is another service of the Campus Center. Its student professional staff advises and assists student organizations with programming ideas and program implementation. The office maintains complete files and information about the multitude of program opportunities available to students and student organizations. CCRO has presented programs in such areas as leadership training, contract assistance for programs, and leading volunteer groups, as well as helped with the production of films, lectures, the performing art series, visual art exhibits, and special events.

Student Activities

Complementing the Campus Center, CCRO and the numerous student organizations which provide for many of the activities for the College is the Programs Committee of the SGA. Working with its various sub-committees it provides hundreds of popular activities each year. Included are regular feature films, lectures, concerts, seminars, coffee houses, Pub entertainment and other numerous social activities.

Student Organizations

Clubs and Organizations

The college encourages participation in student organizations. Through these laboratories for expression, students can develop lifetime skills for achieving personal goals. A multitude of organizations operate on campus offering the student a wide selection. Membership in college clubs and organizations is generally open to all Fitchburg State College students. For meeting times and locations contact the Campus Center scheduling office. A list of the organizations on campus include:

Accounting Society
Aubuchon Hall Council
Band
Biology Club
Business Labs
Choral Arts Association
Communications Club
Commuters Board
Computer Science Club
Cultural Society for Minority Students
Dancin' Club
Data Processing Management Club
Early Childhood Club
Economics Club
Geography Club
Herlihy Hall Club
Honors Club
Human Services Club
Industrial Technology Association
Inter-Fraternity/Sorority Council
International Student Union
Intervarsity Christian Fellowship
Intramural Board
Karate Club
Marketing Club
Masspirg
Math Club
Med Tech Club
Newman Association
Nursing Student Association
Outing Club
Psychology Club
Russell Tower Hall Council
Saxifrage (Yearbook)
Scrimshaw (Literary Magazine)
Society for the Advancement of Management
Sociology Club
Special Education Club
Stageright
Student Government Association
Strobe (College Newspaper)
Townhouse Board of Governors
Volleyball Club
WXPL Radio Club
Womens Athletic Association

Fraternities and Sororities
Adelphian Society
Esoteric Society
Fenwick Society
Gaveleer Society
Neasylon Society
Phi Alpha Theta
Philodemic Society
Tokalon Society

The student organization which provides most of the activities for the college is the Programs Committee. Through its various subcommittees, it provides hundreds of popular and well-attended activities each year including films, lectures, concerts, seminars, coffeehouses, pub entertainment and social activities.

The Outing Club and the Campus Center offer and encourage a variety of activities that utilize the environment which surrounds the college. Natural trails provide opportunities for cross-country skiing, jogging, and observing nature in the New England forest. The city of Fitchburg is surrounded by hills which provide the bicycle enthusiast with some of the most challenging hills in New England as well as rolling, easy rides along streams and rivers which run through the city.

Within a short car ride and often available by organized bus trips, Mt. Wachusett and Mt. Watatic offer some of the best skiing in Massachusetts. River rapids for whitewater canoeing are minutes away from the campus. Mt. Monadnock is less than an hour away offering a panoramic view of New England that stretches from Boston to Mt. Washington and beyond on a clear day. State forests also provide camping, fishing and picnic opportunities that can make free time experiences some of the best recreational experiences in the state.

Sports and Recreation

The Department of Athletics at Fitchburg State College, supported by the athletic fee, offers each student an opportunity to participate in activities at the varsity, intramural and recreational level in order to develop the person first, student second, athlete third and the champion fourth.

Intercollegiate

The men's programs include competition in cross country, spring track and field, football, soccer, basketball, ice hockey, baseball, indoor track, and tennis. The women's programs consist of teams in cross country, spring track and field, field hockey, volleyball, basketball, softball, indoor track, and tennis. These sports have enjoyed national and regional recognition as highly competitive NCAA Division III teams. Many student-athletes have been recognized for their athletic achievements being named to various All-American and All-New England teams.

Fitchburg State College is a member of the Massachusetts State College Athletic Conference, the National Collegiate Athletic Association, Eastern Collegiate Athletic Association, New England Athletics Congress, New England Athletic Conference, Massachusetts Association Intercollegiate Athletics for Women, United States Women's Track Association, New England Women's Intercollegiate Cross Country, Track and Field Association, Eastern Intercollegiate Athletic Association, New England Football, New England Women's Basketball Association, New England Intercollegiate Baseball Association, New England Division III Track and Field Association, Athletic Congress of the USA, New England Intercollegiate Amateur Athletic Association, Intercollegiate Soccer Association of America, New England Intercollegiate Softball Association and Amateur Athletic Union, which entitles successful Fitchburg teams to participate in tournament and championship play at the Division III level.

For the purpose of athletic eligibility "satisfactory progress toward a baccalaureate degree" shall be defined as successful completion by the student of 24 semester hours of course work prior to entering his/her third full-time semester; 48 semester hours of course work prior to entering his/her fifth full-time semester; 72 semester hours of course work prior to entering his/her seventh full-time semester. Full-time or part-time status shall be determined at the end of the ADD/DROP period. In addition, students must maintain the following academic averages (semester and cumulative): 0-29 s. hrs.-1.6; 30-59 s. hrs.-1.8; 60 s. hrs. and above-2.0. Students on academic probation are ineligible for intercollegiate athletics unless their cumulative grade point average is above a 2.0 and their probationary status is based solely on their previous semester's average.

Intramural/Recreation

An active intramural program offers the opportunity to all students to participate in a wide range of sports in an atmosphere that stresses sportsmanship, fun and enjoyment. Team and individual competition is offered in such sports as volleyball, basketball, bowling, ice/street hockey, football, soccer and ultimate frisbee. All

full-time students are members of the Women's Athletic Association/Men's Intramural Board. These organizations are responsible for providing intramural sports as well as other recreational activities such as ice and roller skating, splash parties, tennis and badminton tournaments, racquetball nights, open gym/weight room and any other activities suggested to and by W.A.A. and M.I.B.

Facilities

Parkinson Gymnasium contains the volleyball courts, basketball courts, weight room for training and conditioning purposes, and the Office of the Certified Athletic Trainer. Outdoor facilities for the athletic programs, located at the Robert G. Eliot Complex on Pearl Hill Road, include fields for soccer, football, field hockey, baseball and intramurals; chem-turf track; tennis courts; and outdoor basketball courts which double for ice skating during the winter season. At the McKay Campus School the gymnasium is utilized for intramural activities and is the location of our varsity softball diamond. All ice programs are held at the George Wallace Civic Center. The offices of the Department of Athletics are housed in the Anthony Building on the main campus.

Student Services

Career Services

The Career Services Center provides a variety of career development activities for students in their life/work planning. Students are encouraged to increase their self-understanding and effectiveness in making career decisions. The Center provides counseling, guidance, and other assistance important to career planning. Outreach programming in classrooms and residence halls is regularly scheduled.

A Career Services newsletter called The Edge highlights upcoming activities and information and is published monthly during the school year.

Housed in the office is the Career Resource Center which contains career literature, career resource directories and company literature, among other items. Material in the Resource Center supports one's search for occupational information and is designed to assist in career development.

Job search strategy information is provided to all students seeking work, whether full-time or part-time, permanent or temporary, professional or more entry level. Job vacancy notebooks are maintained which contain local, state, national and overseas openings. Handouts and workshops are regularly provided to address resume and interview preparation. Credential files are maintained by the Center and on-campus interviews between employers and students are coordinated. All graduating students should complete a placement registration card to become eligible for job matching.

Testing services and consultation are also available to students in the Career Services Center. Vocational development testing is available for students who wish to explore their career interests, personality and values.

Several national programs of standardized testing are administered through the college: Graduate Record Examinations; College Level Examination Program (CLEP); Miller Analogies Test, and Medical College Admissions Test. Inquiries regarding these test should be made at the Career Services Center. The Center is open from 8:30 a.m. to 5:00 p.m. weekdays, and is located on the third floor of the Hammod Building on campus. Students may stop in to use the resources or make appointments by telephoning.

Counseling Services

Counseling Services provides confidential, short-term counseling services to all students at no charge. Psychotherapists are available for individual personal

counseling, group and couples counseling, education programming, crisis intervention, workshops and community referrals.

In addition to the professional counselors, ACCESS, a group of student peer counselors, is available to talk with students about a variety of college-related concerns.

Counseling Services is located in the Hammond Building, third floor. Hours are 8:30 a.m. to 5:00 p.m. 3 days a week and 8:30 a.m. to 7:30 p.m., two days a week. Emergency and drop-in hours are also available daily. Appointments can be made in person or by calling.

Health Services

The goal of the Student Health Services at Fitchburg State College is to provide equitable, accessible, quality health care to the student community at a reasonable cost.

The yearly health services fee is utilized in programs of prevention, education and referral, as well as in diagnosis and treatment of illnesses. Such services include blood pressure screening, CPR, annual Health Fair, and workshops on health care.

Health care is provided through the cooperative and combined efforts of a physician, nurse practitioner, registered nurse and a certified medical assistant.

The Health Service provides treatment for episodic illnesses and injury, with referral to appropriate local hospitals and physicians when necessary. Arrangements can be made through the Health Service for certain types of immunizations and allergy injections.

The Health Service is open from 8 a.m. to 8 p.m. Monday through Thursday, and 8 a.m. to 4 p.m. on Friday, and is located in the Anthony Building.

New Student Orientation

The goals of orientation at Fitchburg State College are as follows: to provide new students with sufficient and complete academic information so that they can make intelligent course selections; to acquaint them with the facilities, programs, and activities at the College; to answer preliminary questions about any and all facets of campus life; to begin providing the students with necessary skills in academic, social, and personal areas to ensure a successful beginning to their college experience; and to assist students with their transition to a new environment by providing time for them to meet other new students and begin forming friendships important to their development as an individual.

The New Student Orientation Program is coordinated by the Student Affairs Office and consists of two different phases. During the summer students are invited to participate in a one-day on-campus session for the purpose of Academic Advising/Course Registration. Each student attends an academic advising session with faculty from his or her department prior to the registration session. Just prior to the beginning of school, in late August or early September, new students are invited to return to campus for an intense three (3) day program, entitled "Orientation: The Transition Begins."

The "Transition Begins" consists of a series of activities designed to give the new students a broad range of information and to introduce them to campus life. Each student receives an information packet containing local maps, answers to frequently-asked questions, and information on campus activities. The students receive extensive campus tours in small groups, which afford them the opportunity to visit offices while in operation and to ask questions freely. Similarly, the students are given frequent opportunities to meet in small groups throughout the program to

ask questions and share information and experiences. Special-interest group meetings are held on such topics as study skills, adjustment to college, special needs of transfer students, and housing. Social, recreational, and cultural activities comprise evening entertainment. The students take their meals in Holmes Dining Commons and spend two nights in a college residence hall, giving them an experience in on-campus living. Academic activities during orientation are also numerous. Learning preference and reading skills aptitude evaluations are administered to each student during "The Transition Begins." These evaluations provide the students information about their learning style and reading ability which will assist them in adjusting to their new academic environment.

Students with Handicaps/Disabilities

The Student Affairs Office in conjunction with the office of the Director of Facilities, provides ongoing assistance to students with disabilities in accessing college programs and services. Students with disabilities are expected to move like all students through the college offices and classrooms, but from time to time their particular disability may necessitate additional information and accommodation.

Handicapped students are strongly encouraged to participate in a preorientation interview to facilitate their entry experience. Arrangements for this interview may be made through the Student Affairs Office.

Admissions

General Policy

Fitchburg State College endeavors to offer admission to those students whose high school records and backgrounds offer promise of a successful and satisfying college experience. Each applicant is considered individually, and the decisions of the Committee on Admissions are based on many factors. Consideration is given to applicants regardless of their sex, race, religion or national origin.

Fitchburg State College adheres to the minimum admissions requirements as specified by the Board of Regents Admissions Standards Policy. Meeting these requirements, however, does not guarantee admission. Additional entrance requirements may be necessary for admission.

Taken into consideration are the high school record, rank in class, scores on tests administered by the College Entrance Examination Board, letters of recommendation from the high school principal, guidance counselor or teachers, and the extracurricular and outside-of-school activities. Strong emphasis is placed on the high school record and rank in class.

Fitchburg State College supports the efforts of secondary school officials and governing bodies to have their schools achieve regional accredited status to provide reliable assurance of the quality of the educational preparation of its applicants for admission.

Applications are accepted beginning in October. All applications and supporting credentials should be received by March 1 for freshman candidates and April 1 for transfer candidates for fall semester admission. Applications and credentials should be received by December 1 for admission to the spring semester.

Applications

To be considered for admission to the College, applicants must submit the following to the Office of Admissions:

1. An Application for Admission to Fitchburg State College. Applications may be obtained at high schools or community colleges throughout the Commonwealth of Massachusetts or by writing directly to the Admissions Office at Fitchburg State College.

2. A transcript of the complete high school record through the first marking period of the senior year. (All students, before entrance to the College, must be graduated from high school or offer equivalent preparation.)

3. College Entrance Examination Scholastic Aptitude Test (SAT) scores and the Student Descriptive Questionnaire (SDQ). Although not required, the College welcomes the results of the College Entrance Board Achievement Tests. Many candidates present Achievement Tests in English and applicants who expect to continue in a foreign language in college should take an Achievement Test in that language. Other Achievement Tests may be taken in the student's major fields of interest. Note that it is the applicant's responsibility to arrange for the forwarding of test scores directly to the College from the Educational Testing Service in Princeton, New Jersey. The College code number is R 3518.

4. A recommendation for the applicant from his or her high school principal, guidance counselor or teacher, showing evidence of academic interest, ability, and preparation.

5. A resume of activities if there has been a time lapse between high school graduation and the application process to Fitchburg State College.

Interviews are not required but can provide the Admissions Committee with helpful information. The College encourages students with handicaps and disabilities to discuss their situation with an Admissions Counselor and with the Vice President of Student Affairs to learn what accomodations might be provided by the College. Applicants who desire to have an interview or to visit the campus are invited to call the Admissions Office for an appointment.

Fitchburg State College employs a "rolling admissions" policy. Rather than a simultaneous notification of all applicants, candidates are notified on a continuing basis over a period of several months, beginning in the early part of January for September applicants.

Transfer Students

Transfer students are welcome at Fitchburg State. Only students with satisfactory academic and personal records can be considered. An applicant is considered a transfer applicant if he/she has earned 12 or more semester units (18 quarter units) of college credit by his/her planned entrance date.

It is important to recognize that to be considered for transfer the applicant must have a grade point average of 2.0 or better. This average, however, does not guarantee admission to the College.

Inquiries regarding the length of time required to complete a degree should be addressed to the Admissions Office.

It is the policy of the College that a student transferring from a two-year institution is entitled to transfer no more than the two years of credit (60-64 credits) which constitute the requirement of the Associate Degree program taken as a unit.

No more than 50 percent of the total credit hours required in the student's major program may be transferred from another institution.

The following credentials must be submitted by transfer applicants:

1. Application for Admission.

2. Transcript or transcripts of all previous college work, including a statement of honorable dismissal from the last college attended.

3. A catalogue from the previous college(s) with the courses taken clearly marked.

4. A resume of activities if there has been a time lapse between high school graduation, further schooling, and the application process to Fitchburg State College.

All transfer students will be subject to special provisions of the mathematics and English remediation policy. See, "Remediation Program".

Transfer credits will normally be granted for work completed in other accredited colleges which was of passing grade or better. Full credit will be given to transferred courses which coincide with those offered at Fitchburg State. A preliminary credit evaluation will be sent with the student's acceptance letter.

The transfer credit evaluation is made only after an application has been processed and admissibility has been determined.

The grade point average from the previously attended college is dropped and the grade point average is newly established at Fitchburg State.

A student who has completed the general education requirements of one State College prior to transferring to another State College will not be obliged to meet additional or different general education requirements of the receiving college with the exception of students transferring to the Maritime Academy.

Transfer students exempted from a three-hour Composition requirement in any accredited college or junior college may be exempt from EN 100. No credit is to be given. Students exempted from a six-hour Composition requirement will be exempt from EN 100 and 120. No credit is to be given.

In accordance with the Board of Trustees' policy, the following guidelines have been established:

1. Applicants for transfer to any college in the Massachusetts State College system will be evaluated for admission on the basis of their previous college academic record.

2. Whenever possible, degree credit will be granted for course work completed at recognized institutions of higher education. Courses which do not fit the degree program may be counted as fulfilling the open elective requirements of the four-year curriculum. The transfer student will be required to fulfill the same degree requirements as any other student.

3. A student transferring from a baccalaureate level college must successfully complete at least 45 credits as a Fitchburg State College student, normally to include the senior year, in order to receive a degree.

To be given consideration, all applications should be made to the College by April 1.

New England Regional Student Program

This program enables residents of Connecticut, Maine, New Hampshire, Rhode Island and Vermont to be considered for admission to certain academic programs at Fitchburg State College. Applicants selected under this program are granted reduced tuition rates (25% above in-state tuition, rather than full out-of-state tuition). The main eligibility requirement is that the program of study not be offered in the public colleges of the student's state of residence. For additional information, contact the New England Board of Higher Education, 45 Temple Place, Boston, MA 02111.

International Students

Support for those International Students attending Fitchburg State College is part of the responsibility of the Student Affairs Office. Services offered include: assisting international students in their transition to college, identifying and creating support groups, sponsoring cultural awareness programs and assisting students with the necessary paperwork and communications with the United States Immigration Service.

International Students should provide evidence that they have sufficient funds to support themselves for at least the first academic year.

Campus Visits

The Admissions Staff believes that all applicants should visit the Fitchburg State campus and is, therefore, pleased to offer a variety of visitation programs. Daily student-guided tours are conducted Monday through Friday at 10:30 A.M., 11:30 A.M., and 2:30 P.M. Fridays at Fitchburg Open House will be held on October 23, November 13, November 20 and December 4, in 1987. Saturday Information Sessions will be held on October 31, November 14, December 12, in 1987 and February 20 and March 5 in 1988. The Transfer Information Day will be held on March 24, 1988. Information on any of these visitation programs can be obtained by writing or calling the Admissions Office:

Admissions Office
Fitchburg State College
160 Pearl Street
Fitchburg, MA 01420-2697

Telephone: 617-345-2151 Ext. 3144, 45

Expenses and Financial Assistance

Expenses

The following list includes the essential expenses (exclusive of such items as clothing, travel, and entertainment) for which a student would budget for an academic year.

Application Fee (not refundable or applicable to tuition);	$10
Tuition: In State:	$936
Out of State:	$3,132
Registration Fee (not refundable but applicable to tuition)	$50
Student Activity Fee	$48
Athletic Fee	$108
Books, Supplies Approximately	$200
Library Fee	$20
Placement Fee (senior only)	$5.00
Resident Hall Deposit (not refundable but applicable to second semester room charge)	$50
Room and Board(see Room and Board for Resident Students)	
Educational Service Fee	$20
Campus Center Fee	$50
Health Fee	$32
Residence Hall Damage Deposit	$50
MASSPIRG (optional)	$8.00
Orientation Fee (one time)	$35
Student Teaching and Field Experience Fee (usually seniors only)	$75
Insurance (optional) students only (spouse and family plan available) approximately	$165
Computer Services Fee	$30

All fees are subject to adjustment by the Massachusetts Board of Regents in keeping with changing costs of operations.

All bills must be paid with either cashiers checks, money orders, bank checks, travelers checks, VISA or Mastercard. No personal checks will be allowed.

Application Fee
$10 (not refundable or applicable to tuition).

Tuition
For residents of Massachusetts: $936 per year-$468 per semester.

For non-residents: $3,132 per year-$1,566 per semester.

For persons age 60 or over, no tuition for courses with available seating after tuition-paying students are enrolled.

Room and Board for Resident Students
The cost of board is $970 per academic year for the 19 meal plan; $480 per academic year for the five-day lunch plan, but the room cost depends on the hall to which the student is assigned. All students living in traditional residence halls must have a full meal plan. The maximum charge for room at present is $1,430 annually and is payable in equal installments at the beginning of each semester.

A residence hall deposit of $50.00 is required of all students accepted for rooming in a College residence hall. This payment, not refundable, is credited against the second semester room charge.

Refund Policy
For new students, freshmen and transfer, there is a $50.00 non-refundable tuition deposit. Such deposit shall be credited to the students first semester tuition charges. If such a student withdraws prior to the beginning of classes, full tuition refund less, the $50 deposit, will be given. If the student withdraws within the first week of the beginning of classes, two-thirds of the tuition charge shall be refunded. If the student withdraws between the end of the first week and the end of the second week, one-half the tuition charge will be refunded. If the student withdraws between the end of the second week and the end of the third week, one-third of the tuition charge will be refunded. A student withdrawing after the third week of classes will not be entitled to any refund.

For returning students: A student who has paid tuition prior to the opening of school and who notified the school that the student will not be attending any class will be entitled to a full refund of all tuition and fees. If the student withdraws between the beginning of classes and the end of the first week, two-thirds of the tuition charge will be refunded. If the student withdraws between the end of the first week and the end of the second week, one-half the tuition charge will be refunded. If the student withdraws between the end of the second week and the end of the third week, one-third of the tuition charge will be refunded. A student withdrawing after the third week will not be entitled to any refund.

Fees are not refundable after the start of classes. Room and Board charges are refundable based upon the occupancy agreement and meal contract respectively.

All costs listed above reflect Trustee policy as of February 1, 1987. Costs may increase if so voted by the Board of Trustees.

Any funds received for educational purposes will be applied on the basis of first funds received, first funds applied toward bill.

Any indebtedness to the College which becomes past due, immediately jeopardizes the students enrollment, and no such student shall be permitted to

graduate or register for a subsequent semester or summer school term. Further, any student who fails to pay all indebtedness to the College may not be issued diplomas, degrees, or other official statements, unless otherwise mandated by law.

Veteran Education

Fitchburg State College is an approved institution for providing education for the Veteran.

The Veteran must contact the Registrars Office to establish eligibility and to confirm that all necessary paperwork is complete. Veterans wishing to apply for benefits through the Registrars Office must bring their:

DD214 Form (notarized copy)
Marriage Certificate
Birth Certificates for each dependent child

The Registrars Office will provide the Veteran with an Application for Benefits or the Change of Place of Training Form, whichever is applicable.

Veterans are urged to keep themselves informed about benefits available to them through the Veteran's Administration. Information may be obtained from:

John F. Kennedy Federal Building
Veterans Administration-Regional Office
U.S. Government Center
Boston, MA 02203

Vietnam Veterans from Massachusetts are entitled to attend Fitchburg State College on a no-tuition basis. Additional information may be obtained from:

The Commonwealth of Massachusetts
Department of Education
1385 Hancock Street
Quincy, MA 02169

Financial Aid

Fitchburg State College will attempt to award financial assistance to any academically qualified student whose family and/or personal resources are insufficient to meet the College costs. The premise of Financial Aid programs is that parents and students are primarily responsible for meeting college costs. When the costs involved exceed the amount parents and/or students are reasonably able to contribute, financial need exists. Financial assistance is considered a supplement to the family contribution and is based on financial need, which is the difference between the family's resources and the amount of educational costs at the College. Fitchburg State College uses the Massachusetts Financial Aid Form (MFAF) as its approved form of need analysis. The family contribution is primarily derived from the information the family lists on the MFAF. These forms are available in high school guidance offices or in the College Office of Financial Aid.

Fitchburg State College administers and coordinates a variety of financial aid programs. Financial Aid is based on need and the availability of funds. It is also contingent upon the student's satisfactory progress in his/her course of study.

For the purpose of Financial Aid, satisfactory progress toward a baccalaureate degree shall be defined as successful completion by the student of 24 semester hours of course work prior to entering his/her third full-time semester; 48 semester hours of course work prior to entering his/her fifth full-time semester; 72 semester hours of course work prior to entering his/her seventh full-time semester, and 96 semester hours of course work prior to entering his/her ninth full-time semester. In addition, the student must be maintaining a "C" grade point average prior to his/her third year of study. It is the student's responsibility to ascertain whether they are maintaining satisfactory academic progress at the end of each academic period. Students will be notified during the award letter process, if they are not maintaining satisfactory academic progress.

Students should begin application procedures well in advance of the term during which they are seeking assistance and should observe the deadline for the various programs for which they apply. Those interested in specific programs or seeking specific or updated information should consult the Financial Aid Office as early as possible for assistance in their financial aid planning. Financial Aid is not renewable, and must be applied for each year.

All students should file for the Pell Grant Program and the State Scholarship Program. In approximately four to six weeks applicants will receive the results from the Pell Grant Program. These should be submitted to the Financial Aid Office for processing with a Fitchburg State College Application for Financial Aid and a copy of parents and/or students previous year Federal Income Tax Return (1040, 1040A, 1040EZ).

Applicants for financial aid must be citizens of the United States or permanent residents.

The DEADLINE for submission of the FAF and all supporting documents is March 30.

Below are brief descriptions of the types of financial assistance available at Fitchburg State College. For additional information, please contact the Financial Aid Office to request a copy of the Financial Aid Handbook.

Gift Aid is usually in the form of grants or scholarships and is called gift-aid because it does not have to be repaid or worked for.

The following forms of gift-aid are available at Fitchburg State College:

Pell Grant

The PELL Grant Program named in honor of the programs sponsor, Senator Pell, was formerly known as the Basic Grant Program (BEOG). It is a federally sponsored entitlement program designed to assist students who have exceptional need. A PELL Grant must be reapplied for prior to every year of undergraduate study.

The PELL Grant is considered to be the floor or base of a financial aid package. In many cases, it will be combined with aid from other sources. All students applying for financial aid are required to apply for the PELL Grant.

Massachusetts State Scholarship Programs

The Massachusetts Board of Regents of Higher Education administers seven state scholarship programs for Massachusetts residents. The Massachusetts Information and Instruction leaflet contains all information as well as specific application instructions. The leaflet is contained with the Massachusetts Financial Aid Form (MFAF), available at a college or university financial aid office or a high school guidance office.

All Massachusetts students are required to apply for the Massachusetts General State Scholarship. The maximum award at Fitchburg State College is $1,000 in an academic year. Students are notified of this award directly from the Board of Regents of Higher Education, Boston, Massachusetts. Awards are based on financial need. Students attending Fitchburg State College or planning to attend may also apply for the following State Scholarship Programs:

Special Education
Fire, Police, Corrections
Honor

Students at Fitchburg State College must apply directly to the College for the Special Education Scholarship.

Other States' Grants
Students from Connecticut, Maine, Maryland, New Hampshire, the District of Columbia, Rhode Island, Pennsylvania, and Vermont may be eligible to receive a State Scholarship from their respective state. Each scholarship program has varying guidelines and deadlines; therefore, students are urged to contact the state scholarship program in their state for further information.

Tuition Waiver Program
The Tuition Waiver Program established by the Commonwealth of Massachusetts is awarded to those students demonstrating financial need. The program is designed for Massachusetts residents. Students awarded a Tuition Waiver would have a portion of the actual tuition cost waived.

Supplemental Educational Opportunity Grant
The Supplemental Educational Oportunity Grant is awarded only to those students with extreme financial need who would otherwise be unable to attend a post-secondary institution.

Awards are limited by the amount the college receives from the government and they must be matched dollar for dollar from another source of aid. This is a federally funded program administered by the College.

Scholarship Programs

Fitchburg State College Scholarships
Institutional scholarships are awarded at various times throughout the year. This process is monitored, and the final decisions are made by the College Scholarship Committee. The scholarship process is publicized in several different ways. Posters with all the necessary information are distributed campus wide (including residence halls). The college newspaper and the Campus Center Calendar both publish the deadline dates. Additionally, the campus radio station informs listeners that applications are available and gives the date for submission of all necessary materials. The scholarship committee encourages students to apply for the many scholarships.

All students are required to complete a general application form indicating the specific scholarship(s) for which they are applying. The criteria for most scholarship awards is financial need, academic achievement, involvement at the college, and a personal statement. Recommendations are required. Each year the college awards approximately *$60,000 in scholarship monies. The scholarships are described in detail below.

The M. Lillian Smith Scholarship ($100.00)
To be awarded to a student pursuing a course of study in Education.

"Buddy McMurray Good Fellowship Award" (Amounts Vary)
Will be awarded to a student whose contribution to the College is positive, salutary, and inspirational of the goals for which they entered Fitchburg State College.

Hammond Band Scholarship ($100.00)
Available to the full-time undergraduate student chosen as the outstanding member of the Fitchburg State College Band.

LeBlond-O'Sullivan Memorial ($100.00)
Available to full-time juniors or seniors with financial need and a record of service to the College.

Parking Scholarships ($300.00)
Made available from fines collected for illegal parking on campus to full-time students who have completed at least one semester and have at least one year remaining at the College.

Performing Artist (Amounts Vary)
This scholarship is awarded to a full-time undergraduate student who is an outstanding performing artist.

Special Education ($100.00 to $300.00)
Available to full-time day students who are special education majors and graduates of a Massachusetts high school.

Thomas A. Cardamone Scholarship (Amounts Vary)
Available to a full-time student enrolled in any of the Industrial Technology Department degree programs. Financial need and proven leadership skills are required. This award was instituted by Epsilon Pi Tau, Epsilon Chapter, in memory of Thomas Cardamone.

Carl T. Witherell ($300.00)
Available to full-time undergraduate students who are industrial arts majors, preferably members of Epsilon Pi Tau.

Alumni Scholarships (Amounts Vary)
Available to currently enrolled students with demonstrated financial need and/or who are in good academic standing.

Fitchburg Business and Professional Womens Club ($300.00)
Available to full-time women students commuting from Fitchburg, Ashby, Ashburnham, Lunenburg, Townsend or Westminster.

Student Government Association (Amounts Vary)
Available to sophomores, juniors or seniors with a 2.2 cumulative average and a record of leadership.

The Matti N. Antila Poetry Award ($100.00)
This is an annual prize awarded to a student at Fitchburg State College for a poem. The award is made possible from Lauri and Signe Sipila in memory of Signes parents, Matti N. and Fanny P. Antila.

Dorothy Mellinger Scholarship ($300)
Available to a senior special education major who has a cumulative GPA of at least 3.5 and a demonstrated financial need. This scholarship is made possible from Mr. and Mrs. Martin Mellinger in memory of their daughter, Dorothy.

Flora D. Mulholland Memorial Scholarship (Amounts Vary)
This scholarship is available to a Nursing student evidencing high scholastic achievement and a demonstrated financial need.

The Wallace Cunningham Scholarship (Amounts Vary)
This scholarship is awarded to a student evidencing high scholastic achievement and a demonstrated financial need.

The William Devries Memorial Scholarship Fund (Amounts Vary)
This scholarship is awarded to a member of the Fenwick Society evidencing high scholastic achievement and a demonstrated financial need.

Departmental Scholarships (Amounts Vary)
These scholarships offer a work component and experiential opportunity for upper-class students to work closely with the departmental chairperson of their specific discipline. There is no financial need base for this award. High consideration is given to those students of academic excellence and previous departmental service. Applications are available at the Financial Aid Office; however, final decisions are made by each specific department.

Eugene W. Clement Memorial Scholarship (Amounts Vary)
This scholarship is available to a Junior, Special Education major who is making a special effort to achieve academically and has demonstrated financial need.

Michael Vignale Memorial Scholarship (Amounts Vary)
This scholarship is available to a student pursuing a degree in Chemistry.

John McNaney Memorial Scholarship (Amounts Vary)
This scholarship is available to a student pursuing a degree in Chemistry.

Burnham Walker Memorial Scholarship (Amounts Vary)
This scholarship is available to a Senior student who has demonstrated academic achievement and articulated his/her career plans.

Kirkpatrick-Percival Scholarship ($50) This award is available to an outstanding Senior Psychology major.

Special Talent Awards
This program allows the institution to waive a portion of the students tuition. It is a program administered with or without regard to financial need. It is awarded by a special committee to students who demonstrate above average academic qualifications and/or above average talent in the visual or performing arts.

William E. Clark II Memorial Scholarhship
To be given to a student who evidences cademic achievement, financial need and potential to succeed.

The Presidents Honors Scholarships ($500)
The Presidents Honor Scholarships recognize the scholarly achievements of high school seniors and transfer students who expect to enter Fitchburg State College and who have demonstrated excellence in their studies and academic endeavors. The awards are in the amount of $500 each. The Scholarship Review Committee uses the following criteria in making its selection:

- High school students must be in the upper 5% of their graduating class.
- Transfer students must have a 3.75 G.P.A. (Transfer students should have completed a minimum of 30 semester hours.)
- Three letters of recommendation.

  Renewal students who have received this award must maintain a 3.75 G.P.A.
- Renewal could be denied for a serious reason.

The President's Scholars Awards ($500)
The President's Scholars are undergraduate students who have demonstrated excellence in their studies and academic endeavors at Fitchburg State College. The awards are in the amount of $500 each. The Scholarship Review Committee uses the following criteria in making its selection:

- Sophomore, Junior or Senior status. A minimum of 30 semester hours of work must have been completed
- Three letters of recommendation/at least two of which must be from members of the Fitchburg State College faculty.
- Cumulative G.P.A. of 3.75 or above.
- Further information may be obtained from the Office of the Undergraduate Dean.

Army Rotc
Advanced Course. All students contracted into the ROTC Advanced Course (last two years) receive $100 per month during the school year. Additionally, cadets are paid for attending Advanced Camp summer training; this can bring the total to $2600 for the last two years in the program.

Scholarships. For students already attending college, numerous two- and three-year scholarships are available. Scholarships include payment of tuition, a flat rate for books, supplies and equipment, and certain other educational expenses plus, a $100 monthly allowance during the school year for each year the scholarship is in effect. Scholarships are awarded based upon merit, academic discipline and the individual's demonstrated abilities and character. Application and further information are available through the Department of Military Science.

Nursing Scholarships. For students majoring in nursing, these scholarships pay the same tuition, fees and monthly allowance as regular scholarships but have a higher book and equipment allowance. Additionally, the nursing cadets attend a Nurse Summer Training Program instead of the Advanced Summer Camp. There they receive practical experience in an Army hospital, under the guidance of a nurse preceptor.

Simultaneous Membership Program (SMP). As a member of both Advanced ROTC and the Massachusetts National Guard, the non-scholarship student will receive the financial benefits of both programs. The Massachusetts Education Assistance Bill waivers the tuition requirements. The student receives advanced standing for pay purposes (up to $2100 per year) as a member of the National Guard. In addition, the student is eligible to receive full ROTC allowances and pay (up to $2600 for the program).

Student Loan Programs

National Direct Student Loan Program
The National Direct Student Loan is a long term, low cost loan, designed for educational purposes. Awards are contingent upon available funds and number of applicants.

The interest rate is charged on the unpaid balance of the loan. All terms of the National Direct Student Loan are stated on the Promissory Note and Truth-In-Lending Statement, copies of which will be provided to those requesting such information, along with a sample loan repayment schedule. Provisions are available for deferments, postponements and/or cancellations for some specialized areas.

Nursing Student Loan Program
The Nursing Student Loan Program is designed for those students in need of financial assistance to further their education in the field of Nursing.

Loans are limited by the amount of money the College receives from the Federal Government.

Guaranteed Student Loan Program
The Massachusetts Higher Education Assistance Corporation enables students to apply to local banks and lending institutions for education loans to help meet their educational costs. The Financial Aid Office has a listing of all participating lenders in Massachusetts.

Parent Loans for Undergraduate Students
The Parent Loans for Undergraduate Students (PLUS) program enables parents to borrow for each dependent child enrolled in an eligible college or vocational training program. These loans are an alternative funding source for parents whose dependent children may not qualify for other types of financial assistance.

Massachusetts Educational Loan Authority
This is a loan program offered by a Private Agency. In many ways it is similar to the PLUS Program; however pay back can be extended for a longer period of time and the interest rate is generally a little lower. Additionally, a family can borrow up to three quarters of the student's cost of attendance.

Emergency Loans
Small loans for unexpected non-college bills may be obtained by students from the Office of the Vice President for Student Services. The loans must be repaid within sixty days. The student must have collateral or show an ability to repay the loan within sixty days or by the end of the semester, whichever comes first. The student should visit the Office of the Vice President for Student Services to obtain additional information on this program.

Employment Programs

College Work Study Program
The College Work Study Program is a federally funded program providing an opportunity for part-time employment on campus for students with financial need. Students may work during the academic year and during the summer. Work Study jobs are offered as part of the student's total financial package. Students will be paid directly for the hours worked on a bi-weekly basis.

Fitchburg State College Employment
In addition to the federal program, the College offers part-time employment on campus to its students. These positions are not open to students who have had their financial needs met by the other programs mentioned above. Students are paid variable rates depending upon the position. Available jobs are posted and students are required to apply directly to the office advertising for help.

Massachusetts Educational Employment Program
The Massachusetts Educational Employment Program (MEEP) allows students an opportunity for part-time employment on campus. It is a need-based program and the job a student secures must relate to his/her academic major.

Off-Campus Employment Center
The Career Services Center has established a service to help meet the needs of students seeking part-time employment off-campus. This Office, located on the third floor of the Hammond Building, has canvassed the community and organized a substantial listing of part-time employment openings in the area. These include such positions as babysitting, yard work, construction, caring for the elderly, tutoring, repair work, and a variety of other odd jobs. The hours are often flexible and can be geared to your academic commitments.

Academic Services

The College Library

The Fitchburg State College Library, located in the James J. Hammond Building, provides study tables, study carrels, and lounge seating on four floors. Hours for exam period, vacations, January Intercession and the Summer Schedule are posted. It is a comprehensive information center where source materials are available in a variety of formats. The library collection of 181,000 volumes (151,000 Printed Books and 30,000 microbooks) includes an 11,000 volume reference collection and a Children's collection of 7,000 volumes. The library also houses an expanding Special Collections Department which includes the College Archives and the Robert Cormier Collection. The library subscribes to approximately 1,200 periodical titles which are indexed in the periodical abstract and indexing services located on the first floor. The Periodicals Department also includes the Resources in Education Collection (ERIC), a comprehensive updated education library retrieval system on microfiche, consisting of a growing collection of 250,000 items; and an updated pamphlet file of 4,500 items. Fitchburg State College Library also houses a record collection of about 4,000 titles. In addition, the library now offers fee-paid, on-line data-base searching.

Service for the collections is provided by professional librarians who staff the Library Information Desk on the first floor of the library. These librarians also conduct library instruction classes for the college community. To arrange for such a session, please contact the staff at the Library Information Desk (Ext. 3223).

The Skills Centers

Developmental Skills Center

The College maintains a Developmental Skills Center where assistance is available for students who desire to improve their skills in reading, writing, or mathematics or their general study skills. The Developmental Skills Center is

located on the third floor of the Hammond Building and consists of the Writing Skills Center, Mathematics Center, and Developmental Reading and Study Skills Center.

It is the policy of the Board of Trustees that students admitted to state colleges who suffer from serious deficiencies in reading, writing, and mathematics may be required as a condition of attendance to avail themselves of remedial courses and other prescribed help. See, "Remediation Program..."

The Developmental Skills Center is open from 8:30 to 3:30 Monday through Friday (check with the Mathematics Department regarding its Center's hours), without charge, to all students in the College.

Mathematical Skills Center
The Mathematical Skills Center, under the direction of the Mathematics Department, provides free tutoring to all college students on a drop-in basis. Tutors are Fitchurg State College students. Assistance is available in most areas of mathematics, including arithmetic, algebra, statistics and calculus. The Center is open afternoons and evenings. Check with the Mathematics Department for specific hours.

Study Skills Center
Programs offered by the Study Skills Center are designed to meet the individual needs of all students. Included in the Center's programs are enrichment experiences for students wishing to review or sharpen their study skills, as well as programs for those students who wish to learn successful college study practices. In addition, students may select a program which highlights a specific study area such as test taking skills, outlining skills, or successful study habits. The Center also offers an intensive program for students wishing to improve their spelling skills. The Study Skills Center makes use of a wide variety of instructional resources including a new computer assisted instruction facility.

Reading Center
Programs offered at the Reading Center are designed to meet the individual needs of all students. Enrichment programs are available for slow readers with good comprehension who want to increase their speeds and for students wishing to build strong vocabularies. Developmental programs, concentrating on comprehension skills, help students understand what they read. Additionally, all students are taught how to adjust their rates of reading to meet their particular purposes. Students may enroll in reading courses any time and select hours convenient to them. One credit is earned upon completion of an individually-designed reading program. There is no charge for these programs.

Writing Skills Center
The English Department operates a Writing Skills Center, staffed by both faculty and peer tutors, where students may get help at any time for their writing problems. Students can review conventions of grammar, punctuation, and spelling and also get assistance in all stages of the writing process, from planning to proofreading. Any instructor in the College may refer a student to the Center, and any student who desires assistance may voluntarily apply to the Center. A wide variety of programs and instructional materials is available to students at the Writing Skills Center.

College Computer Center

The Fitchburg State College Computer Center is a service department of the College. Facilities are provided to service the administrative, educational and research needs of the campus. The principal unit of equipment in the Center at the present time is a Control Data Computer CDC Cyber 180-810 Main Frame

Computer which is connected to the Regents Computer Network in Boston in a multihost configuration. At this time the College has on order a large DEC VAX to enhance the computing environment. The Computer Center is located in the Edgerly Building along with the Department of Computer Science. There are 28 interactive terminals, a line printer and a micro computer (handicap access) that are primarily for academic use by students and faculty. These terminals are located in the Edgerly Building. There are AT&T Micro Computers in each Academic Department, as well as 3 Micro Labs for student use, two in Edgerly and one at McKay. Connections between computing resources are provided by the AT&T Information Systems Network Local Area Network. The Local Area Network with almost 400 nodes using fiber optics allows computing resources to be physically dispersed across the campus and still be an intregal part of the College computer resources

Computer usage ranges from the computation of assigned classroom problems to the support of special projects of administrators and faculty. Many students begin to use the computer early in their programs of study, and some continue to do so into graduate work. Opportunities to pursue courses of study oriented toward computer science and management information systems are available and are described elsewhere in this catalog.

The Computer Center provides computing and communication services for the academic and administrative members of the College community. The Center maintains a strong professional staff and a wide range of computing facilities that are in keeping with its goal of providing state of the art support within a policy of convenient open access to computing facilities and cooperative research, planning and implementation of systems and services.

In addition to the central computing facility, the Computer Science Department has available a Digital VAX/11-730 System, 2 INTEL Multi-User Micro-Computers, 4 AT&T 3B2 Super Micros, 3 Industrial type Robots, Lexidata 8400D Unit Based Industrial Graphics Systems, LSI-1103's, 2 Motorola Industrial Development Systems, 10 Zenith Micro Computers, 2 Truevision image processing stations, 70 Heath ET-3400 Microprocessor Trainers and 20 Heath ET-6800 Assy Language Trainers for hands-on and laboratory use. These systems allow the students to work on design experiments which would be impossible or impractical on the large central computers. Students are exposed to a wide variety of software including the languages Basic, C, Ada, Pascal, Lisp, Prolog, Fortran, Cobol, Modula and Statistical and Word Processing packages.

Academic Advising Center

The Academic Advising Center is staffed by regular full-time faculty chosen for their specific expertise in assisting students to make the best possible use of their academic experience. The Center, located on the first floor of Thompson Hall, is open when classes are in session. While students have faculty advisors in their major departments, the Advising Center assists students who are having academic difficulty, non-traditional students, undeclared students, and students who are having difficulty interpreting specific academic regulations. In addition to the faculty advisors, the Advising Center staff includes a secretary and part time personnel who assist students by answering general information questions and distributing useful handouts on study skills, etc. The Academic Advising Center is supervised by the Staff Associate to the Academic Vice President, under the direction of the Undergraduate Dean.

The Center also sponsors a support group for Mature and Returning Students (M.A.R.S.). The group meets weekly and schedules various events especially for older students.

Academic Regulations and Procedures

Registration

Academic Advising

All undergraduates are joined to their programs through a system of Academic Advisors. Declared Majors are assigned to a member of that Department who shall act as the student's guide through the mazes of the curriculum. Undeclared Majors are assigned, on a temporary basis (according to the student's intended major), to such available faculty as the Undergraduate Dean can identify. Each student is encouraged to consult his/her advisor at any time during the semester regarding any problem encountered involving the academic program.

The student must consult with his/her advisor in the matter of Course Registration. Course enrollment may only be arranged and approved through the advisor. By agreement all faculty are available to their students, for class and other adivising, at least three hours a week. These hours are posted at the Department offices and are also available through the Office for Academic Affairs.

Course Registration

Registration for courses is not only a periodic necessity but an educational experience in itself. It teaches balancing of desires with grinding reality. The student, of necessity, learns about conflict, attention to detail, and the filling in of OPSCAN forms. In all these experiences the Academic Advisor is a key but not the ultimate authority.

Semester registration involves matching the course desires/needs of the student body with the finite number of course offerings in any one semester. Hours of meetings, numbers already enrolled, as well as prerequisites are factors to be weighed. The student must achieve a conflict free schedule of between 12 and 18

Semester Hours which are acceptable to the Advisor and to the Registrar. These Schedules are subject to student change; incomplete programs may be filled during the Drop/Add period.

All students are bound by the curriculum requirements set in the College Catalog of the year of matriculation. However, the College reserves the right to alter those requirements where necessary in order to meet statutory, educational, or professional standards and quality educational goals.

The Add/Drop Window
A student may add or drop a course(s) during the first two weeks of a semester without notation on her/his permanent record. The process simply requires the student to secure the signature of the instructor for the course(s) concerned upon so-called Add/Drop cards which are in the possession of the instructor. "Drops" are considered the decision of the student and the advisor.

Overload
A course load of more than 18 Semester Hours is an overload. Overloads must be specifically and individually authorized upon forms available at the office of the Undergraduate Dean. This form requires acceptable reasons for the overload and the signatures of the student's advisor and that of the Undergraduate Dean. Students with a cumulative average earned at FSC of less than 3.0 will not usually be authorized to carry an overload.

Changing Majors/Degree Programs
Changing Majors and/or Degree programs is possible after the student has begun his/her studies; however, a student must meet the requirements for the desired major. Some programs (e.g. business) cannot accept all applicants who wish to transfer to that field. Therefore, students should consider more than one choice when either changing majors or when moving from "undeclared" to declaring a major. It should also be noted that changing a major very often requires an increase in the time required to complete the baccalaureate.

In general, the student would begin the process of changing Majors/Programs by consulting her/his advisor and the chair of the new major department. Majors/Programs having defined specific requirements for internal transfer are Business Administration, Communications, Economics, Human Services, Nursing, and Special Education. Transfer application forms are available in the Academic Advising Center, Thompson Hall 115, or in the departmental offices.

Withdrawal From Courses, Third to Eighth Week of the Semester Students may withdraw from courses with the notation "W" on their record up to the eighth week of the semester. Course withdrawals are made upon a form issued by the Registrar. This form requires the signatures of both the instructor concerned and of the faculty advisor. It is the responsibility of the student to secure the form from the Registrar before expiration of the withdrawal period.

There is one limitation upon withdrawal from courses that may be significant for some students. Full-time enrollment status requires that the student carry a load of 12 credits. Eligibility for V.A. benefits, Dean's List Honors, Scholarships, Varsity Athletics, Health Insurance Coverage, and Federal Financial Aid, are involved.

Withdrawal From Courses After the Eighth Week
Withdrawal from a course after the eighth week of the Semester, unless documented extenuating circumstances are established, will result in a 0.0 for the course.

Withdrawal From the College
Students who leave the College, either during a semester or between semesters must complete a WITHDRAWAL FORM which may be secured at the Office of Student Services, the Office of Academic Affairs, the Counseling Center or the

Advising Center. Students who withdraw within the first eight weeks of the semester will receive "W" in each course. Students who leave the College after the eight weeks will receive "F" grades in all their courses.

Attendance
It is the prerogative of the instructor to place a value upon class attendance subject only to the limitation that the members of her/his classes be informed as to that value early in the semester. The instructor's class attendance standard should be stated in the course syllabus. Wherein acceptable cause for absence can be substantiated, it is recommended that the student show such to the instructors concerned.

Class Cancellations
In the event of inclement weather the cancellation of classes will be reported on WBZ, WEIM, WFGL, WTAG, WGAW, WEEI, WCMX, WFTQ and WINQ radio stations.

Readmission After Suspension
Students suspended from the College for academic reasons, must remain away from the College for two semesters before requesting readmission. During this time students may be required to retake the courses which they failed, thereby raising their cumulative average to the minimum required for their class. The academic work completed in the interim is evaluated by the Registrar and the Undergraduate Dean prior to readmission.

A student who is suspended twice for academic deficiencies may not again apply for readmission.

Return After Withdrawal
A student who withdraws from the College in good standing without completing a baccalaureate degree may return to the College upon request to the Registrar. To insure his/her return at the time desired, the student should take such a request to the Registrar before May 1 for the fall semester or before November 1 for the spring semester.

In determining "good standing" the College will consider academic and social records (College Judicial Board) as well as financial records of the applicant student.

Evaluation

The Grading System
The College Grading System is 4.0, 3.5, 3.0, 2.5, 2.0, 1.5, 1.0, 0.0. In this system, 4.0 equals excellent, 3.5 or 3.0 is good, 2.5 or 2.0 is average, 1.5 or 1.0 is poor but passing, and 0.0 is failure.

The cumulative average standard is derived by multiplying the grades earned in each course by the credits earned for that course; the total of the products obtained for all courses taken is divided by the sum of the credits attempted.

The student's cumulative average is the basis of the student's academic status; it is involved in all Honors and academic disciplinary considerations

The Incomplete (INC) Grade
In certain situations wherin a student has completed 80% of the course work but is prevented by illness or an equivalent disability from completion, the instructor may award the grade of Incomplete. Incomplete grades must be made-up by the close of the fourth week of the following semester; if not, a grade of 0.0 is automatically entered upon the permanent record. Incomplete grades are not considered in evaluations to determine the student's status. Grades which result from the make-up of an Incomplete will not change a probationary or dismissal status, nor

will they count toward Dean's List or President's List status. They may, however, change financial aid or athletic eligibility status.

Make-up of Failed Courses
Wherein the student earns a grade of 0.0 in a course, this failure should be made up by retaking the course. On passing of the course, this grade replaces the 0.0 in calculations of the cumulative average, if earned at FSC. A make-up earned at another institution will satisfy the course requirement. The grade earned will not enter into cumulative average calculations, but the original 0.0 will be removed from the cumulative average. In each case, the original 0.0, with a line drawn through it, remains on the permanent record.

A grade of 1.0 or 1.5 is passing and students may **NOT** retake courses in which they receive a passing grade.

Academic Dishonesty
Academic dishonesty in all its forms, including cheating, fabrications, plagiarism and facilitating academic dishonesty, is not tolerated by Fitchburg State College. Violators will be subject to possible academic penalties from professors and may have to come before the Judicial Board, an official body which hears cases involving violations of the "Student Judicial Code."

Academic Status

Academic Standing and Satisfactory Progress
A student is in good academic standing provided he/she is not on academic probation. The academic probation schedule may be found under Academic Probation, Suspension and Dismissal.

A student is considered to be full-time at the College provided that he or she is registered for a minimum of 12 s.h. of course work. If a student must temporarily drop to part-time status due to extenuating personal circumstances and if he/she registers for less than 12 s.h. of course work, the status of his/her housing, financial aid, athletic eligibility, health insurance, and eligibility for the Dean's List is jeopardized. Subsequently this student must take additional courses during the summer or through a course overload if he/she wishes to graduate on schedule with his class.

Any student who wishes to be considered for varsity competition must be a full-time student who has been admitted by the Director of Admissions and is accounted for by the College Registrar. Students who register through the Division of Continuing Education are not regarded as regular full-time students of the college.

For the purpose of Financial Aid and athletic eligibility "satisfactory progress toward a baccalaureate degree" shall be defined as successful completion by the student of 24 s.h. of course work prior to entering his/her third full-time semester; 48 s.h. of course work prior to entering his/her fifth full-time semester, 72 s.h. of course work prior to entering his/her seventh full-time semester; and 96 s.h. of course work prior to entering his/her ninth full-time semester. Full-time or part-time status shall be determined at the end of the ADD DROP period.

Students must also meet the following grade point average standard to maintain financial and athletic eligibility: 0-29 s.h.-1.6; 30-59 s.h.-1.8; 60 and above s.h.-2.0. (See "Conditions of Probation" for further information.)

Honors
The President's List honors students for consistently high academic achievement. The student is named to the President's List when he or she has achieved a semester average of 3.75 or higher for three successive semesters, and the

student is attending the College full-time. However, should the student drop below 3.75 for a semester, even though the cumulative average remains 3.75 or higher based upon the previous semester's achievement, the student is ineligible for the President's List.

A student is placed on the Dean's List for the semester if an average grade of 3.20 or better is attained, and the student is attending the college full-time.

Graduation honors are noted for recognition of an outstanding cumulative average. A student graduates with highest honor, Summa Cum Laude, if the cumulative academic average is 3.80 higher. Similarly a student will be graduated with high honor, Magna Cum Laude, if the cumulative average is 3.50 or higher, and is graduated with honor, Cum Laude, with an average of 3.20 or better. To graduate with honors a student must have completed sixty credits at Fitchburg State College.

Each spring outstanding students are recognized at the Spring Honors Convocation for excellence in their major field and overall scholastic achievement. The following awards are made:

Roger F. Holmes History Award
Outstanding Geography/Earth Science Senior
Matti N. Antila Poetry Award
Exceptional Proficiency in Intercollegiate Forensics
Dr. William J. Goldman Award
Communications/Media Student of the Year
Cutler Award for All-Round Student
Purington Award for All-Round Craftsmanship
Kirkpatrick-Percival Award in Psychology
Award for Excellence in Psychology
Outstanding Academic Achievement Award in Sociology
Outstanding Senior in Biology
Outstanding Senior in Medical Technology
John McNaney Memorial Award
Michael Vignale Memorial Award
ROTC Recognitions
The Grace Gummo Award
The Katherine Sehl Award
The Eleanor Voorhies Award
Christopher Hughes Memorial Scholarship
Hutchinson Award-Outstanding Student in Marketing
Outstanding Senior in Early Childhood Education
Outstanding Senior in Elementary Education
Outstanding Senior in Computer Science
Alumni Association Merit Scholarships
Mary F. Burnham Scholarships
The William Clark Memorial Scholarship

Academic Probation, Suspension and Dismissal

Class Rank

A student's class rank is determined by the number of credits which a student has successfully completed. Satisfactory academic progress is related to class rank.

Credits	*Class Standards (grade point averages)*
Freshman 0-29	Freshman 1.6
Sophomore 30-59	Sophomore 1.8
Junior 60-89	Junior and
Senior 90-89	Seniors 2.0

Failure to maintain the established standard of scholarship means that a student is not in good standing. Such failure will result in academic probation or suspension or dismissal.

Semester Probation and Suspension;—A student will be placed on academic probation at the end of any semester in which he/she falls below the established standard. If that standard is not attained by the end of the following semester, the student will be suspended from the College.

Class Rank	*Probation*	*Suspension*
Freshman (0-29 sem. hrs.)	below 1.6	(two successive terms below 1.6)
Sophomore (30-59 sem. hrs.)	below 1.8	(two successive terms below 1.8)
Junior (60-89 sem. hrs.)	below 2.0	(two successive terms below 2.0)
Senior (90 and over)	below 2.0	(two successive terms below 2.0)

Cumulative Probation and Suspension;—A student will be placed on academic probation at the end of any semester in which his/her cumulative GPA falls below the established standard. If that standard is not attained by the end of the following semester, the student will be suspended from the College.

Class Rank	Probation	Suspension
Freshman	cumulative GPA below 1.6	two successive semesters of cum GPA below 1.6
Sophomore	cumulative GPA below 1.8	two successive semesters of cum GPA below 1.8
Junior	cumulative GPA below 2.0	two successive semesters of cum GPA below 2.0
Senior	cumulative GPA below 2.0	two successive semesters of cum GPA below 2.0

Explanation and Definition

Making up failed courses in summer session or intersession does not remove a student from academic probation, suspension or dismissal.

An Incomplete does not count toward the grade point average either in placing a student on academic probation, suspension, and dismissal, nor in removing him/her from them.

A student who fails one-half or more of the credits completed in any semester will be placed on probation and must have the permission of the Undergraduate Dean to continue in the next semester.

Exceptions
Special consideration may be given to transfer students and AID students by the Undergraduate Dean.

Conditions of Probation
Students placed on term probation for the first time will remain eligible to hold office, to serve on campus committees or to be a member of an athletic team provided that their cumulative grade point average is at least 2.0. This policy can only be applied once during a student's attendance at Fitchburg State College. Any subsequent probationary status will lead to ineligibility for the above activities. This policy does not change the academic policies governing probation, suspension and dismissal. It deals only with eligibility under the circumstances cited above.

A student's financial aid will be continued during a probationary semester; however, a student must be maintaining satisfactory academic progress by the end of the probationary semester (see, Financial Aid).

Program Alternatives

Double Majors/Double Degrees
A student may earn a baccalaureate degree with two majors at Fitchburg State College by satisfying the degree requirements for both programs. Since only one degree is granted, both programs must result in the same baccalaureate degree, A.B., B.S., or B.S. in education.

A student who wishes to earn two baccalaureate degrees at Fitchburg State College must satisfy the degree requirements for both prior to receiving the second degree. He/she must earn 30 semester hours beyond the 120 semester hours required for his/her first degree and spend an additional two semesters at the College.

Independent Study
Beyond the scheduled course offerings in any semester, there is the possibility of independent pursuit of a narrow area within the specialization. The student initiates this option by requesting a given professor to undertake supervision of such study within that professor's specialization. The decision to authorize Independent Study and credit belongs to the professor and the department involved. Final approval of Independent Study projects is given by the Undergraduate Dean. Only three credits of Independent Study may be attempted in one semester. If a student wants to attempt more than three credits, permission must be received from the Undergraduate Dean.

CLEP, DANTES, and Departmental Examinations
The goal of the Fitchburg State College Examination Program is to make it possible for an individual to demonstrate, by performance on an examination, his/her knowledge of the material taught in a college course and as a result receive academic credit. This program is useful for the traditional college student, but it is especially valuable for individuals who have had learning experiences which have taken place outside of the college classroom (self-study, employment experiences, life experiences, etc.). Fitchburg State College will award up to 60 college credits through the Examination Program.

Advanced Placement Examination
Students who score 3, 4, or 5 on the Advanced Placement Examination will receive advanced placement and credit in the area tested.

College Academic Program Sharing: CAPS
CAPS allows students (in good standing) at Fitchburg State College who have completed at least one semester at Fitchburg State to attend another of the

Massachusetts State Colleges. The purpose of the program is to allow students to enroll in up to 30 semester hours of courses in another state college without going through formal registration procedures. Enrollment as a CAPS student requires the approval of the student's department chairperson.

CAPS affords students in the Massachusetts State College System an opportunity to enjoy a broad educational experience with a wide range of faculty, programs, and facilities. The CAPS program is not open to freshmen. Students interested must file a request with the Registrar prior to the Fitchburg State College registration period.

Student Teaching and Certification

All senior education majors are responsible for checking graduation requirements and certification procedures at the beginning of their senior year. Certification procedures will be discussed at scheduled meetings early in the semester.

A student convicted of a felony as defined and identified by the courts of any state is automatically ineligible for a teacher education program.

All transfer students are required to take 12 semester hours from at least three different professors within their respective departments prior to student teaching.

Appeals to any of the above should be directed to the secretary of the Teacher Education Committee.

An incomplete or failure in student teaching necessitates the repetition of the course. Each student must furnish transportation to the teaching assignments.

Screening policies for student teaching include:

Positive recommendation of a majority of the faculty members in the area of the major and/or specialization,

A demonstrated-effectiveness in oral and written communication as evidenced by use of currently acceptable levels of English,

The successful completion of the tuberculin test.

The Teacher Education Council requires that each candidate for student teaching possess a 2.00 cumulative index and a 2.50 index in the major field of study, as each department defines "major field." No incomplete in any course is allowed. No probationary status is allowed. No unresolved failure in a candidate's major field nor any course overload during student teaching is permitted.

Courses and Programs in the College

For internal transfers between majors and from Undeclared into a major, departments and programs have individual requirements and procedures, including minimum grade point averages, formal application forms and designated admission dates. Access into some majors is also numerically limited. See the appropriate Department Chairperson for specific information about application for admission into a particular major.

Departments

Behavioral Science
- Psychology
- Sociology
- Human Services

Biology

Business Administration

Chemistry

Communications/Media

Computer Science

Early Childhood, Elementary and Secondary Education

English/Speech

Humanities
- Art
- Foreign Languages
- Music
- Philosophy

Industrial Technology

Mathematics

Medical Technology

Military Science

Nursing

Physical Education

Physics

Social Science
- Economics
- Geography
- History
- Political Science

Special Education

Majors and Options

Biology
- B.A. Biology
- B.S. Ed. Biology
- * Certification Only
- B.S. Biology
- Biology/Environmental Science
- Biology/Exercise Science

Business Administration
- B.S. Business Administration
- Accounting
- Management
- Management Information Systems
- Marketing

Chemistry
- B.A. Chemistry
- B.S. Chemistry

Communications
- B.S. Communications
- Graphic Design
- Motion Picture Production
- Photography
- Technical Writing
- Non-Broadcast Television Production

Computer Science
- B.S. Computer Science

Early Childhood
- B.S. Ed. Early Childhood
- * Certification Only

Economics
- B.S. Economics

Elementary
- B.S. Ed. Elementary
- * Certification Only

English
B.A. Literature
B.A. Professional Writing
B.S. Ed. English
* Certification Only

Geography
B.A. Geograhy
B.S. Ed. Geography
* Certification Only
B.S. Geography

History
B.A. History
B.S. Ed. History
* Certification Only
B.S. History

Human Services
B.S. Human Services

Industrial Arts
B.S. Ed. Industrial Arts
* Certification Only

Industrial Science
B.S. Industrial Science
Construction Technology
Electronics Engineering Technology
Graphics Technology
Manufacturing Technology

Mathematics
B.A. Mathematics
B.S. Ed. Mathematics
* Certification Only
B.S. Mathematics

Medical Technology
B.S. Medical Technology

Nursing
B.S. Nursing

Psychology
B.A. Psychology
B.S. Psychology

Sociology
B.A. Sociology
B.S. Sociology

Special Education
B.S. Ed. Special Education
Teacher of Children
With Moderate Special Needs (N-9)
Teacher of Children
With Moderate Special Needs (5-12)
Teacher of Young Children
With Special Needs
Teacher of Children With Severe
Special Needs
* Certification Only

Undeclared

Exploratory Option for students in the process of choosing a major.

Minors

Art

Biology

Business Administration

Chemistry

Computer Science

Economics

****Elementary Education***

English

Foreign Languages
French
German
Spanish

Geography

History
European Emphasis
American Emphasis

Industrial Science

Interdisciplinary Graphics

Irish Studies

Mathematics

Music

Philosophy

Physical Education

Psychology

Russian Studies

Secondary Education

Sociology

Theatre

*See Education Department regarding certification requirements.

Art

Professor:
Donna Bechis
Robert Fritz

Associate Professors:
Elmer Arsenault

The Minor in Art

The Minor in Art will require a minimum of 15 semester hours. Students should prepare their minor program in close consultation with an Art Advisor. Students will take Survey of Art Forms I or II, Basic Drawing, Design, Introductory Oil Painting and at least one course chosen from Three Dimensional Design, Advanced Painting, Sculpture, the Museum Internship or Art History.

*Asterisk indicates that the course is offered infrequently.

AR 100 **3 cr. 3 hr.**
Survey of Art Forms I
A study of archecture, sculpture and painting from ancient Egyptian times to the Renaissance in Europe. Emphasis is placed on understanding style in these various art forms.

AR 120 **3 cr. 3 hr.**
Survey of Art Forms II
A survey of significant styles in the architecture and painting of the Western World from the year 1800 to the present with emphasis upon the special nature of the visual experience.

AR 140 **3 cr. 6 hr.**
Drawing
A studio course which introduces students to the practice of drawing with emphasis upon the description of form through means of line, shade and perspective. Investigation of a variety of media as well as basic stylistic alternatives is encouraged.

AR 150 **3 cr. 6 hr.**
Life Drawing
The basic problems in form and anatomy are studied while drawing from the nude and costumed model. Various techniques and tools are explored including a study of some of the great masters' drawings.

AR 160 **3 cr. 3 hr.**
Design
The basic elements of design will be applied to the creation of two- and three- dimensional form. Studio work will explore the effect of black and white, color and mixed media on form.

AR 170 **3 cr. 3 hr.**
Three Dimensional Design
Three Dimensional Design concepts as they have been applied historically. Topics covered include form, space, structure, scale, line and color. Lectures, slides, film, museum visits and visual presentations included in course program.

AR 180 **3 cr. 3 hr.**
American Art
A survey of significant stylistic developments in architecture painting and the decorative arts from the earliest colonial times to the present.

AR 190 **3 cr. 3 hr.**
Renaissance Painting
The development of painting in Italy from 1250 to 1550, the age of Michelangelo. The Northern Europe Renaissance from 1400 to 1700 is also surveyed culminating in the Baroque period of Rembrandt.

AR 200 **3 cr. 6 hr.**
Introductory Painting
A study of the basic problems of form, color, and texture as understood in oil paintings. Consideration is also given to the nature and use of the oil painting materials themselves.

AR 210 **3 cr. 3 hr.**
Contemporary Art
Course will consist of active student participation in slide discussions, studio work, and museum and gallery trips. Subject matter will be based on contemporary trends in art dating from the 1960's to the present.

AR 214 **3 cr. 4 hr.**
Ceramics
This course includes throwing on the wheel and glazing techniques with strong emphasis on different sculptural forms. (Credit will not be given for both IT 214 and AR 214.)

AR 220 **3 cr. 6 hr.**
Introduction to Sculpture
This studio course explores and teaches the basic techniques and materials applied to the building of three-dimensional form. Students will learn to conceive, develop, and build sculpture using traditional as well as contemporary methods and materials.

***AR 240** **3 cr. 6 hr.**
Advanced Sculpture
This studio course is an expansion upon the basic principles of sculpture, on a more advanced level. Sculpture projects will be

geared toward the individual interests and requirements of the advanced student. AR 220 is a prerequisite.

AR 250 **3 cr. 6 hr.**
Advanced Painting
Accent is placed on the painting of the portrait. Anatomical and formal construction is studied and consideration is given to painterly values of color and texture.

***AR 270** **3 cr. 6 hr.**
Pictorial Design
This course continues where Advanced Painting ends. Emphasis is given to figure painting, both costumed and nude model. The total figure is studed anatomically and in terms of basic forms. Continued study of color and texture problems.

AR 280 **3 cr. 3 hr**
Art in Elementary School
Practice of art as well as observation and discussion of the philosophy of art education in the elementary grades.

***AR 300** **3 cr. 6 hr.**
Museum Internship
Offered jointly with the Fitchburg Art Museum. Emphasis on museum management and particularly the arrangement of exhibitions. Only by permission of advising art faculty. Two art courses, at least one in art history, are prerequisites.

AR 425 **3 cr. 4 hr.**
Crayonstone Lithography
Students print and prepare their stones, develop and transfer their illustrations to the stones, draw and shade on their stones and print their illustrations. (Credit will not be awarded for IT 279 and AR 425.)

AR 490 **3 S.H.**
Independent Study in Art
For selected students, upon approval of both department head and advising instructor.

AR 493 **3 cr. 3 hr.**
Topics in Art
Courses having a more narrow focus or those taught on an irregular basis may be offered. New courses may be taught on an experimental basis under this title.

Biology

Chairman:
Stanley Dick

Professors:
Neal Anderson
George Bond
Stanley Dick
Stanley Krane
Rose Marie Neunherz
Donald Schmidt
Robert Zottoli

Assoc. Professors:
George Babich
Alice T.O'Malley
Howard Thomas

Asst. Professors:
Benjamin Andrusaitis
Dorothy Boisvert

B.S. and B.A. in Biology
All students in either the Bachelor of Science or Bachelor of Arts programs in Biology are offered a required core sequence of the following courses:
BI 140 General Botany
BI 160 General Zoology
BI 230 Ecology
BI 280 Genetics
BI 430 Cell Biology
BI 400 Developmental Biology

The philosophy behind this Core Curriculum is to provide a nucleus of fundamentals upon which students can build and expand in a variety of elective and specialized directions. Twelve semester hours of additional biology electives at or above the 200 level are required of biology majors. They may be chosen in one area of specialization. These specializations can be developed, in consultation with a faculty advisor, into individualized informal academic career tracks, such as: Environmental Science; Plant Science; Animal Biology; Medical Physiology; Molecular Biology/ Biochemistry; Exercise and Sports Science; Aquatic Biology.

The B.S. and B.A. in Biology degrees both require the following additional courses in related sciences:

CH 110/CH 120
General Chemistry I and II
CH 200/CH 210
Organic Chemistry I and II
PH 130/PH 140
General Physics I and II

Two courses in mathematics at or above the level of MA 130, Elementary Functions. Since not all advanced elective courses in Biology are offered in any one academic year, Biology

majors are urged to consult closely with their academic advisors to design in advance a suitable selection and sequence of both required and elective courses.

The B.A. in Biology, in addition to all the above requirements, requires foreign language proficiency at the second year college level.

B.S. in Education, Secondary Biology
The Bachelor of Science in Education, Secondary, in Biology can be obtained by fulfilling all the requirements for the B.S. in Biology plus the following additional professional courses:

BI 485 Biology Teaching Methods or ED 485 Special Methods in Secondary Education
BI 486, 487
Biology Student Teaching (12 semester hours)
PY 110/230
General Psychology/Adolescent Psychology
PY 275
Tests and Measurements
EN 470
Teaching Writing to Secondary Students
ED 301
Successful Practices in Secondary Education

B.S. in Biology/ Environmental Science
The Bachelor of Science in Biology/Environmental Science includes all requirements of the B.S. in Biology. Additional requirements are:

ES 100 Seminar in Environmental Science
ES 480
Internship in Environmental Science

Three semester hours of electives in Environmental Science
Six semester hours of Earth Science or Geology
Three semester hours in Computer Science

For Specialists in Environmental Science, the Department recommends that the General Education social sciences requirement be partially fulfilled by courses in Geography, Macroeconomics, Environmental Law and Urban Planning; and that courses in Photography, Drawing, Ethics, and Technical Writing be used to fulfill the General Education humanities requirement.

B.S. in Biology/Exercise and Sport Science (see Physical Education)
Exercise Science Course Requirements (12 s.h.)
PE 412
Biomechanics of Sport
PE 404
Behavioral Concepts of Sport
PE 307
Exercise and Sport Science
BI 495
Internship

A Minor in Biology
The minor in Biology will provide a means by which students can include and demonstrate in their academic record evidence of a substantial and coordinated subsidiary expertise in biological sciences.

The minor in Biology requires a minimum of 18 semester hours of course work in the area distributed as follows:

A. One year (6 semester hours) of entrylevel Biology sequences

BI 100/BI 110
Life Science I and II, or
BI 120/BI 130
Anatomy and Physiology I and II, or
BI 140/BI 160
General Botany and General Zoology

B.
BI 280 Genetics

C. Nine semester hours of 200-, 300-, or 400-level courses selected after consultation with a minors advisor in the Biology Department. These upper-level courses should emphasize one of two possible tracks: 1) ecological-organismic or 2) biomedical-molecular.

Asterisk indicates that the course is offered infrequently.

BI 100 **3 cr. 4 hr.**
Introduction to Life Science I
The course focuses on the history, philosophy and content of biology as a science. Laboratory work includes experiences that emphasize problem solving by the student. Primarily for the non-major. 2 hrs. lecture, 2 hrs. lab per week. Offered: Fall semester.

BI 110 **3 cr. 4 hr.**
Introduction to Life Science II
Continuation of BI 100. 2 hrs. lecture, 2 hrs. lab per week. Offered: Spring semester.

BI 120 **3 cr. 4 hr.**
Anatomy and Physiology I
Structure and function of the human organism on the cellular, tissue, organ, and system levels. Cellular metabolism, histology and the following systems: skeletal, muscular, and nervous (including the special senses). The laboratory emphasizes both physiology and the dissection of preserved mammalian specimens. 2 hrs. lecture, 2 hrs. lab per week. Offered: Fall semester. (Not open to students who have completed BI 240, Human Biology or BI 242, Human Physiology)

BI 130 **3 cr. 4 hr.**
A continuation of BI 120. The following systems are covered: circulatory, breathing, digestive, excretory, endocrine and reproductive. 2 hrs. lecture, 2 hrs. lab per week.
Offered: Spring semester.
Prerequisite: BI 120. (Not open to students who have completed BI 240, Human Biology or BI 242, Human Physiology)

BI 140 **3 cr. 4 hr.**
General Botany
The structure, physiology and life cycles of the algae, fungi, bryophytes, ferns, gymnosperms, and angiosperms. Relationship of plant biology to agriculture and medicine is also discussed. Laboratory involves study of live and preserved plant materials, simple physiological experiments and a plant growth project. 2 hrs. lecture, 2 hrs. lab per week.

BI 150 **1 cr. 1 hr.**
Seminar in Modern Biology
Discussion of current topics in basic and applied biological research based on readings of original scientific reports. Each student is expected to prepare one brief presentation on a topic of his or her choice.

BI 160 **3 cr. 4 hr.**
General Zoology
A course designed to acquaint students with basic zoological concepts. Emphasis will be placed on such topics as: scientific method; cell structure and function, structure and function of tissues, organs and organ systems; evolution; and a general survey of the principle phyla of the animal kingdom. 4 hrs. lecture, laboratory, field trips per week.

BI 181 **3 cr. 4 hr.**
Science in Elementary Education
Content, methods, and resources suggested by curriculum groups are examined and experiences developed that exemplify current thinking in science education. Recommended only for majors in Education.

***BI 220** **3 cr. 4 hr.**
Plant Physiology
Individually paced integration of plant structure and function emphasizing physiology of the integrated plant: water relations, transpiration and translocation, mineral nutrition, photosynthesis, respiration, growth hormones, differentiation and morphogenesis. 2 hrs. of conference, 2 hrs. lab per week, plus additional hours. Offered: Fall semester (alternate years).
Prerequisites: BI 140 and General Chemistry.

BI 230 **3 cr. 4 hr.**
Introductory Ecology
Survey of major ecological concepts and methodology as a basis for further investigations of the dynamic relationship between organisms and their environment. Field and laboratory work emphasize problem identification, formulation of hypothesis, data collection, and analysis and interpretation of results in terms of their biological implications. 2 hrs. lecture, 2 hrs. lab field trips per week. Offered: Fall semester.
Prerequisite: BI 100 or 140 or 160 or permission of instructor.

BI 240 **3 cr. 3 hr.**
Human Biology
Anatomy and physiology of the cells, tissues, organs and organ systems of the human organism and their functional interrelationships. 3 hrs. of lecture, lab, demonstration. (Not open to students who have completed BI 120 130).

BI 242 **3 cr. 3 hr.**
Human Physiology
Intensive study of the structural organization and functional operation of the human organ systems and the interrelationships of these systems. (Intended for students who are majoring in Biology or Medical Technology. Not open to students who have completed BI 120 and BI 130.

BI 245 **3 cr. 3 hr.**
Nutrition
Examination of nutrients in foods and their metabolic role in normal nutrition. Emphasis will be on energy sources and utilization, vitamins

and minerals, nutritional requirements in relation to the changing demands of life, and the effect of food handling and processing on the nutrient content of food. Lectures, discussions and personal nutrition projects.

***BI 250** **3 cr. 4 hr.**
Histology
Systematic survey of the basic animal cell and tissue types, followed by in-depth microscopic study of the major organ systems. Practical work includes histological microtechnique on normal and pathological specimens. Lecture, lab, demonstration, plus some additional time. Offered: Alternate years.
Prerequisite: BI 160 or BI 240 or BI 242 or BI 120/130.

***BI 255** **3 cr. 3 hr.**
Social Biology
An exploration of the biological and cultural evolution of man and how that evolution has developed or caused specific societal problems. A study of the biological explanations for and possible solutions of these problems. 3 hrs. of discussion per week, 1 hr. independent study. Offered: Alternate years.
Prerequisite: 6 semester hours of Introductory Biology or equivalent.

***BI 260** **3 cr. 3 hr.**
Conservation and Human Ecology
An introductory exposure to applied ecology, primarily for non-majors, intended to develop a disciplined sensitivity to human environmental interactions. Individual projects will require the identification of specific conservation problems in local communities, their sources, and proposals of practical means for their solution. 3 hrs. lecture/lab per week. Offered: Fall semester. (Alternate years)

***BI 270** **3 cr. 4 hr.**
Survey of Micro-organisms
Introduction to the biology of major groups of microorganisms: bacteria, viruses, protozoa and fungi, their role in nature and their relationship to man as agents of infectious diseases. Laboratory emphasizes principles and practices of aseptic techniques and diagnostic identification and culture of disease entities. 2 hrs. lecture, 2 hrs. lab per week, plus some additional time. Offered: Spring semester.
Prerequisites: BI 130 and Introductory Chemistry or permission of Instructor.

BI 280 **3 cr. 4 hr.**
Genetics
Basic principles of biological information processing: Mendelian inheritance; sex determination; chromosome cytogenetics; linkage, recombination and genetic mapping; mutagenesis; molecular genetics and gene-enzyme relationships; quantitative inheritance. Laboratory work includes study of mutational effects and analysis

***BI 290** **3 cr. 4 hr.**
Marine Biology
Investigation of the distribution of the dominant animals and plants in a salt marsh, sand beach, tide pool, and rocky intertidal area. Data on physical and chemical factors of these habitats will be correlated with the composition, behavior and physiology of the flora and fauna of each habitat. 4 hrs. of lecture/ lab/field work per week, plus some additional hours. Offered: Fall semester (alternate years).
Prerequisites: BI 140, BI 160 and permission of Instructor.

***BI 300** **3 cr. 4 hr.**
Parasitology
The morphology and diagnostic identification of representative groups of parasitic protozoa, helminths and arthropods, and their functional life cycle and pathogenic relationships to animal and human hosts. Epidemiology, pathology and control and treatment of important parasitic diseases. 2 hrs. lecture, 2 hrs. lab per week. Offered: (alternate years).
Prerequisite: BI 160.

***BI 310** **3 cr. 4 hr.**
Ornithology
An inquiry into the life of birds. Emphasis is on correlation of structure, function and behavior. Laboratory studies of external characters, anatomy and criteria for identification. Optional field trips. 2 hrs. lecture, 2 hrs. lab per week. Offered: Spring semester (alternate years). Prequisite: BI 110 or BI 160 or permission of Instructor.

***BI 315** **3 cr. 4 hr.**
Ichthyology
The study of the classification, ecology and physiology of the fish common to Massachusetts. Both marine and freshwater species will be covered, with field collecting trips planned. Class time will be divided between lecture and laboratory work. Offered: Fall semester (alternate years).
Prerequisite: BI 160 and BI 230, or permission of Instructor.

***BI 320** **3 cr. 4 hr.**
Invertebrate Physiology
An experimental course designed to acquaint students with the physiological activities of invertebrate animals. Experiments are conducted on feeding and digestion; respiration and circulation; osmotic regulation and excretion; nerve reception and responses; effectors; and conducting systems. Lecture/lab/demonstration. Offered: Fall semester (alternate years).
Prerequisite: BI 160.

***BI 330** **3 cr. 4 hr.**
Entomology
Anatomy, habits, life histories and identification of insects and some related anthropods. Laboratory work includes preparation of a representative collection of adult and larval forms from terrestrial and aquatic environments with emphasis on techniques for identification of these forms. 4 hrs. lecture/laboratory, plus additional hours for field trips and identification. Offered: Fall semester (alternate years).
Prerequisite: BI 160 or permission of Instructor.

***BI 340** **3 cr. 4 hr.**
Limnology
A study of fresh waters and their inhabitants: survey of protists, invertebrates, vertebrates and plants collected from local waters and their ecological interrelationships as determined by biological, physical and chemical parameters. 1 hr. lecture, 3 hrs. lab/field trips per week. Offered: Fall semester (alternate years).
Prerequisites: BI 140 and BI 230 or permission of Instructor.

***BI 350** **3 cr. 5 hr.**
Plant Taxonomy
Classification of higher plants in accordance with evolutionary principles and trends. Laboratory is devoted to the techniques of plant identification with emphasis on the terminology and use of botanical keys. Field trips for collecting representative elements of the local flora and preparation of an herbarium. 1 hr. lecture, 4 hrs. lab per week, plus some independent project work. Offered: Fall semester (alternate years).
Prerequisite: BI 140 or permission of Instructor.

***BI 360** **3 cr. 4 hr.**
Biology of Algae
Collection and identification of common algae found in the New England area. Emphasis on freshwater forms, but some study of marine algae as well. Distribution of algal species will be correlated with physical and chemical factors in their habitats. Laboratory will include study of algal physiology and reproduction as well as techniques for cultivation. 1 hr. lecture, 3 hrs. lab/field trips per week.
Prerequisite: BI 140.

***BI 370** **3 cr. 4 hr.**
Mammalogy
A study of the biology of mammals with emphasis on New England species. Laboratory work will include identification and preparation of small mammal study skins. Field trips will be made to capture and study animals in the field and to visit museums for access to study collections and habitat groupings of the larger mammals unlikely to be seen in the wild. 4 hrs. lecture/laboratory plus additional hours for field trips. Offered: Spring semester (alternate years).

Prerequisite: BI 160 or permission of Instructor.

***BI 390** **3 cr.**
Tropical Marine Biology
A course designed to acquaint students with a variety of tropical marine habitats. Students will be involved in small individual or group projects at a location in the Caribbean for approximately two weeks during the winter intersession. They will be expected to read selected articles during the semester prior to the trip, and on completion, a comprehensive report on the results of their investigation will be required of each individual or group. In addition, each student is responsible for their travel, room and board expenses for the trip. Offered: Spring semester (including the winter intersession).
Prerequisites: Permission of Instructors.

***BI 400** **3 cr. 4 hr.**
Developmental Biology
A detailed description of developing embryos from the fertilized egg through the various stages leading to the adult organism. Current theories regarding the molecular mechanisms underlying cell differentiation and other classic developmental processes is also a major theme of this course. Other topics include regeneration, metamorphosis, aging and cancer. Laboratory involves study of development in live sea urchins, birds, frogs and ferns as well as work with prepared slides. 2 hrs. lecture, 2 hrs. lab per week. Offered: Spring semester.
Prerequisites: BI 140, BI 160, BI 280, or permission of Instructor.

***BI 410** **4 cr. 6 hr.**
Biochemistry
Individually paced, mastery-oriented introduction to the chemistry of biologically important molecules and their metabolism and regulation; water, proteins, lipids, carbohydrates, nucleic acids and their components. Laboratory emphasizes manual and instrumentated techniques for isolation, qualitative and quantitative analysis of macromolecules and the kinetics and induction of enzymes. 2-4 hrs. lecture/conference, 3 hrs. lab per week. Offered: Fall semester.
Prerequisite: Organic Chemistry

***BI 425** **3 cr. 3 hr.**
Endocrinology
A study of chemical integration of physiological processes by hormones and related agents. Discussions include structure and function of vertebrate and other animal endocrine systems; neuroendocrine relationships; and other topics of current interest. 3 hrs. lecture, demonstration. Offered: Alternate years.
Prerequisites: BI 160 and BI 120, 130 or BI 240 or BI 242, or permission of Instructor.

***BI 430** **3 cr. 4 hr.**
Cell Biology
Cell and subcellular structure and function. Membranes, cell organelles, bioenergetics, photosynthesis, DNA and RNA structure, function and replication, protein synthesis and gene regulation are the major areas considered. Laboratory includes absorption spectrophotometry, cell fractionation, organelle isolation, DNA isolation and denaturation. 2 hrs. lecture, 2 hrs. lab per week.

***BI 460** **3 cr. 3 hr.**
Evolution
An introduction of the principles and processes governing the evolution of living organisms. Emphasis will be placed on the ways by which the various other biological disciplines relate to evolutionary studies. A survey of paleontological evidence will be given to demonstrate how evolutionary principles have affected life. 3 hours of lecture per week.
Prerequisites: BI 140, 160, 230, and 280 or permission of instructor. Offered: Alternate years

***BI 470** **3 cr. 3 hr.**
Environmental Health
Investigations into that aspect of public health that concerns itself with forms of life, chemical substances, environmental conditions and other forces in the surroundings of man that exert an influence on his health and well-being. 3 hrs. of lecture/discussion and occasional field trips. Prerequisite: BI 110 or equivalent or permission of Instructor.

***BI 480** **3 cr. 3 hr.**
Neurobiology
Neural activity and the neural bases of behavior as illustrated by simpler invertebrate and vertebrate nervous systems. Topics will also include: structure and function of neurons, neurodevelopment, cellular basis of behavior (sensory and motor systems), neuropharmacology, neural plasticity. Lectures/demonstrations. Prerequisite: one year of Animal Biology and one year of Chemistry, or permission of Instructor.

***BI 481** **3 cr. 3 hr.**
Immunology
A survey of the immune response, antibody formation and function, immunosuppression, blood group antigens and antibody-antigen reactions. The principles of complement activity, hypersensitivity and autoallergic reactions. Lectures/ demonstrations. Offered: Spring semester. Prerequisites: BI 440 and Organic Chemistry.

***BI 485** **3 cr. 3 hr.**
Biology Teaching Methods
Methods and philosophical background for teaching of modern biological science. (This course is a prerequisite for student teaching and should be taken the semester prior to student teaching: consult Screening Policies for Student Teachers for other requirements for student teaching.) 1 hr. public school assisting, 1 hr. discussion, 1 hr. independent study per week. Offered: Fall semester. Prerequisites: junior or senior standing, ED 301, PY 223 and permission of Instructor.

***BI 486** **6 hr.**
Student Teaching in Biology I
Student Teaching Practicum in Biology. Students are assigned to cooperating schools for a semester of student teaching.

***BI 487** **6 cr.**
Student Teaching in Biology II
Student Teaching Practicum in Biology. Students are assigned to cooperating schools for a semester of student teaching.

***BI 490** **1 to 3 credits**

Independent Study

Laboratory or other independent research under the guidance and supervision of one or more faculty members. A comprehensive term paper is required for successful completion of the project. Offered: Fall and Spring semesters. May be repeated for credit to a maximum of 9 semester hours. Prerequisites: junior or senior standing, 15 credits of Biology and special permission of the Departmental Curriculum Committee.

BI 493 **3 cr. 3 hr.**

Topics in Biology

Courses having a more narrow focus or those taught on an irregular basis may be offered. New courses may be taught on an experimental basis under this title.

***BI 494, 495, 496** **3, 6, 12 cr.**

Internship

Laboratory or field experience in conjunction with established research programs at cooperating off-campus governmental, industrial or private foundations. Supervision is shared by program directors and faculty members at Fitchburg State College. Assignments, contingent upon students abilities and acceptance by the cooperating institution, involve one or two full days of work per week. May be repeated for credit to a maximum of 12 semester hours. A comprehensive term paper is required after each semester of internship work for successful completion of the project. Prerequisites: senior standing and approval of the Biology Department.

Business Administration

Chairman:
George Murphy

Professor:
George Murphy

Asst. Professors:
Ann Bogojavlensky
Diane Caggiano
David Carey
Martin Cusack
James Conlin
Robert Kelleher
John McKeon
Francis Morrison
William Moriarty
James Noonan
Harold Schonbeck
Gary Vostok
Charles Wellens
Barry Wolfson

Assoc. Professor:
John Boursy

Instructors:
Sylvia Charland
Joseph McAloon

The Business Administration Program at Fitchburg State College includes concentrations in either of four areas of business: accounting, management, marketing, or management information systems.

Core Curriculum

Principles of Accounting I and II, Business Law I, Basic Finance, Principles or Management, Fundamentals of Marketing, Economics I and II, Introduction to Programming, Business Calculus, Business Statistics.

The courses beyond the core curriculum are open only to Business Administration majors. These upper-level courses are not transferrable from another College if they are required within a students concentration.

Accounting Curriculum

Intermediate Accounting I and II, Business Law II, Cost Accounting I and II, Tax Accounting, Auditing, Advanced Accounting I and II, Financial Management of Corporations.

Management Curriculum

Production Management, Personnel Management, Business Fluctuations and Forecasting, Organizational Behavior and Theory, Social and Political Environment of Business, Business Policy and Strategy, and Managerial Accounting.

Management Information Systems Curriculum
Introduction to Business Data Processing, Systems Analysis Methods, Structual Systems Analysis and Design, Computer Concepts and Programming Techniques, Data Base Management Systems, Applied Software Development, Managerial Accounting, Business Policy Strategy, and Organizational Behavior and Theory.

Marketing Curriculum
Advertising, Consumer Behavior, Market Research, Managerial Accounting, Business Policy and Strategy, and three marketing electives.

The Minor in Business Administration
The minor in Business Administration consists of eighteen credits. The following four courses are required: Accounting I, Business Law I, Principles of Management, Fundamentals of Marketing and two business electives.

Students minoring in Business Administration may take a maximum of two upper-level courses. These courses must be taken at Fitchburg State College and they must be approved by the Department Chairperson.

Business Laboratories
The department of Business Administration offers students a series of learning laboratory environments providing students with career preparation.

* Asterisk indicates that the course is offered infrequently

BA 110 **3 cr. 4 hr.**
Principles of Accounting I
This course examines basic accounting theory and its application. The course includes the accounting equation; journalizing, posting and trial balance; adjusting and closing procedures; preparation of financial statements; use of special journals, receivables and payables; merchandise inventory; accounting systems and processes.

BA 111 **3 cr. 4 hr.**
Principles of Accounting II
This course deals with the more complex forms of business: partnerships and corporations; capital stock and bonds; retained earnings; income taxes and cost analysis. Prerequisite: BA 110.

BA 210 **3 cr. 4 hr.**
Intermediate Accounting I
In this course emphasis is placed on the application of accounting theory to practice problems in order to develop financial statements of proper form and content. The relationship between various financial statements is constantly reaffirmed. Asset items of the balance sheet are treated comprehensively. Prerequisites: BA 111, BA 220, BA 230 and BA 240.

BA 211 **3 cr. 4 hr.**
Intermediate Accounting II
Liabilities, reserves, funds and stockholders equity items are thoroughly treated. In addition, other topics are covered. Prerequisite: BA 210.

BA 220 **3 cr. 3 hr.**
Principles of Management
This is an introductory course in basic management concepts and practices. This course covers principles and techniques as they relate to planning, organizing, leading and controlling business enterprises.

BA 230 **3 cr. 3 hr.**
Fundamentals of Marketing
This course discusses the role of marketing in our economic and social structure. It includes the planning, distribution, pricing and promotion of goods and services to consumer and industrial markets, viewed as internal activities of the firm, and as shaped by environmental forces.

BA 240 **3 cr. 3 hr.**
Basic Finance
This course studies the forms and sources of financing business firms, large and small, corporate and noncorporate. The emphasis is on financial planning and developing judgment in formulating decisions on financial problems. Prerequisite: BA 110.

BA 250 **3 cr. 3 hr.**
Business Law I
This course is an introduction to the study of business law, its nature and classification, the court systems and their procedures. Contract law, the law of sales and personal property are comprehensively dealt with.

BA 251 **3 cr. 3 hr.**
Business Law II
This course is a continuation of Introduction to Business Law and deals with the law of agency, commercial paper, credit, and the various forms of business. Prerequisite: BA 250

***BA 260** **3 cr. 3 hr.**
Labor Relations and Collective Bargaining I (Private Sector)
An in-depth study of fundamental laborrelations issues: the development of federal labor policy; union organization and union organizing; collective labor-contract negotiation; contract enforcement and the use of strikes and lockouts, boycotts and picketing, and multiemployer bargaining; Arbitration and grievance procedure; health, welfare, and safety concerns; equal employment opportunity; labor economics; and state and federal labor legislation, and the role of government in labor disputes.
Prerequisite: BA 321

***BA 261** **3 cr. 3 hr.**
Labor Relations and Collective Bargaining II (Public Sector)
A continuation of BA 260. A significant part of the second semester will consider public sector collective bargaining and organizing (local, state, and national, and within healthcare organizations).
Prerequisite: BA 260.

***BA 262** **3 cr. 3 hr.**
Labor and Management Relations
This course involves an investigation of the American Labor movement. It is an analytical account of what labor is, why it behaves the way it does, and how it is managed. The course will also cover the various organizational forms and models of labor unions.

BA 270 **3 cr. 4 hr.**
Introduction to Business Data Procession
An overview of Computer Information Systems, this course surveys computer hardware, software, systems and personnel and examines the integration of these components in a commercial environment. A hands-on introduction to computer problem solving using the basic programming language is provided.

BA 271 **3 cr. 4 hr.**
Systems Analysis Methods
An overview of the systems development life cycle, this course introduces the student to the fundamental concepts and techniques of systems analysis and design. Classical and structured methods of systems documentation are explored as well as information gathering and reporting activities. Finally the transition from systems analysis to design is discussed.
Prerequisite: CS 180

BA 280
Business Problem Solving with BASIC
This course will use the BASIC programming language to solve business problems. Structural programming techniques and advanced features of BASIC including multidimensional arrays and file handling statements will be used to develop medium scope business application systems.

BA 312 **3 cr. 3 hr.**
Cost Accounting I
The control aspects of material, labor, and overhead accounting are stressed. The course covers various cost accounting systems and profet planning.
Prerequisite: BA 111

BA 313 **3 cr. 3 hr.**
Cost Accounting II
This course covers planning of profits, costs, and sales through the use of budgets, cost behavior analysis and cash forecasts. The course introduces direct costing, standard costing and conventional gross profit analysis. It emphasizes the uses of cost accounting data for policy making and decision making purposes through breakeven analysis, captial budgeting, differential and comparative cost analysis.
Prerequisite: BA 312

BA 314 **3 cr. 3 hr.**
Managerial Accounting
This course stresses the usefulness of accounting data as it relates to the managerial decision-making process. Computer applications are integrated with the broad objectives relative to planning, control, and analysis. Among the multifaceted areas of study are financial statement analysis, budgeting standard cost analysis, and capital expenditure planning and control.
Prerequisite: BA 111, BA 220, BA 230, and BA 250

BA 320 **3 cr. 3 hr.**
Production Management
The basic principles of production management related to the effective utilization of the factors of production in manufacturing and non-manufacturing activities for both intermittent and continuous systems are discussed. The course will also study production organizations, analytical models and methods, facilities design, and the design of control systems for production operations.
Prerequisite: BA 220

BA 322 **3 cr. 3 hr.**
Business Fluctuations and Forecasting
This course is an analysis of the operations of our free enterprise system with emphasis on the factors responsible for economic instability; analysis of public and business policies which are necessary as a result of business fluctuations.
Prerequisite: EC 120 and MA 280

BA 330 **3 cr. 3 hr.**
Advertising
Topics in this course will include the functions of advertising, planning and advertising campaign copy, artwork and media selection. Students will become knowledgeable about the preparation and use of advertising.
Prerequisite: BA 230, BA 111, BA 220, BA 250

BA 331 **3 cr. 3 hr.**
Consumer Behavior
This course will familiarize the student with the consumer decision-making processes. It will utilize the concepts of the social and behavioral sciences in order to provide an understanding of consumer buying behavior.
Prerequisite: BA 230, BA 111, BA 220 and BA 250.

BA 332 **3 cr. 3 hr.**
Market Research
This course will emphasize the importance of research in marketing planning and decision making. It will include the basics of scientific investigation, the search for information, sampling, data collection, data analysis, interpretation and reporting.
Prerequisite: BA 230, BA 111, BA 220, BA 250 and MA 280.

BA 341 **3 cr. 3 hr.**
Investments
An analysis of stocks, corporate and governmental bonds and other investment media and a study of the secondary stock market mechanism. This course will review various investment vehicles and security evolution. Research of individual companies and industries will be required. Course will be primarily lecture and problem solving.
Prerequisite: BA 111, BA 220, BA 230, BA 240 and BA 250

BA 342 **3 cr. 3 hr.**
Real Estate Investment & Management
The investment, financing and management of real estate with a particular emphasis toward business decision. This course will focus on real estate as an investment good. Its popularity as an investment vehicle can be attributed to a number of income-producing characteristics of which the following are noteworthy: Emphasis on 1) cash flow, 2) changing property values, 3) equity investor, 4) decision-making, 5) risk and return and 6) market research.
Prerequisite: BA 111, BA 220, BA 230, BA 240 and BA 250.

***BA 363** **3 cr. 3 hr.**
Collective Bargaining Methods
After a discussion of strategies and tactics used in labor negotiations, this course will evolve from simulated contract negotiations. It will give the student first hand knowledge of what goes on at the bargaining table.
Prerequisite: BA 220, BA 260 and BA 321.

BA 364 **3 cr. 3 hr.**
Labor Organization and Trade Unionism
This course will provide the student with the knowledge of how unions are organized and operate in the nation. It will include a presentation of the development of craft and industrial unions, the anatomy of local and national labor organizations and of union organizing, and an analysis of the political and economic position of labor unions in the country today.
Prerequisite: BA 111, BA 220, BA 230, and BA 250

BA 370 **3 cr. 3 hr.**
Structured Systems Analysis and Design
This course covers the methodology of structured systems development concentrating on the analysis and design phases of the system development cycle. A case approach to advanced concepts, it is a course in problem solving wherein the student learns strategy and techniques for dealing with complexities in Information Systems Development.
Prerequisite: CS 370, BA 271

BA 371 **3 cr. 3 hr.**
Computer Concepts and Programming Techniques
This course is a survey of technical topics related to computer systems with emphasis on the relationship between computer architecture, system software, and applications software.
Prerequisite: CS 180, BA 271

BA 372 **3 cr. 3 hr.**
Database Management Systems
This course provides an introduction to the concepts of database processing with emphasis on application programming in a database environment. Physical and logical organization of data, data relationships and operational requirements of a database management system are also discussed.
Prerequisite: CS 270, BA 370

BA 410 **3 cr. 3 hr.**
Advanced Accounting I
This course includes accounting problems involved in the preparation of consolidated financial statements and in home and branch office relationships, mergers, and pooling problems are stressed. Special problems in fund and budgetary accounting for government entities and hospitals are covered.
Prerequisite: BA 221.

BA 411 **3 cr. 3 hr.**
Advanced Accounting II
The purpose of this course is to develop in the student the ability to solve a variety of complex problems in order to prepare him for either public professional examinations or executive accounting work in private business.
Prerequisite: BA 410

BA 412 **3 cr. 3 hr.**
Tax Accounting
This course considers the Massachusetts and Federal Income Tax Laws, with application to individuals, partnerships, fiduciaries, and corporations.
Prerequisite: BA 211

BA 413 **3 cr. 3 hr.**
Advanced Taxation
This course will study the Federal income tax laws and regulations applicable to partnerships, corporations, and fiduciaries. Federal gift and estate taxes, reorganizations, and personal holding companies will also be discussed.
Prerequisite: BA 412.

BA 414 **3 cr. 3 hr.**
Auditing
The basic concepts of auditing and control are examined in this course. It emphasizes internal control, audit problems, and professional responsibilities of the C.P.A. to the auditing requirements.
Prerequisite: BA 312

BA 417 **3 cr. 3 hr.**
Fund Accounting
This course will examine the accounting and reporting principles, standards, and procedures applicable to governmental and not-for-profit entities; such as governmental organizations, hospitals, colleges and universities.
Prerequisite: BA 211, BA 313

BA 420 **3 cr. 3 hr**
Organizational Behavior and Theory
This course is a general descriptive and analytical study of organizations from the behavioral science point of view. It includes problems of motivation, leadership, morale, social structure, group networks, communications, hierarchy, and control in complex organizations. The interaction between technology and human behavior is discussed. Consideration of alternative theoretical models is given.
Prerequisites: PY 110, BA 220, BA 230, and BA 250.

BA 421 **3 cr. 3 hr.**
Social and Political Environment of Business
This course is a study of the evolution of American business in the context of its changing political and social environment. Analysis of the origins of the American business creed, the concept of social responsibility of business, and the expanding role of the corporation are included.
Prerequisites: EC 120, BA 220 and BA 250.

BA 422 **3 cr. 3 hr.**
Business Policy and Strategy
This is an integrating course embracing all organic management functions. Cases are used as subjects for analysis and systematic decision making practice.
Prerequisite: senior status.

BA 425 **3 cr. 3 hr**
Practical Problems in Business
This course is designed to explore, discuss, and analyze the values and methods that can be used by our future business managers to make ethical decisions in live business situations. It will provide a basis for consideration of the type of corporate policy and environment essential to minimizing the conflict between "right" and "the end justifies the means."

BA 430 **3 cr. 3 hr.**
Sales Management
This course will enhance the students understanding and skills in managing the selling function. The emphasis is on personal selling as an element in the marketing mix.
Prerequisites: BA 230, BA 111, BA 220, and BA 250.

BA 431 **3 cr. 3 hr.**
Retail Marketing
This course introduces the student to the nature and scope of retail marketing and management. The course will include the structure of retailing, merchandising, buying, pricing, promotion, organization and management of the retail firm.
Prerequisites: BA 230, BA 111, BA 220, and BA 250.

BA 432 **3 cr. 3 hr.**
Industrial Marketing
This course centers on the marketing of goods to industrial firms, governmental agencies and other organizations included within the industrial market. The areas covered in the course will include distribution channels, pricing policies, product planning and market strategy.
Prerequisites: BA 230, BA 111, BA 220, BA 250, BA 330, and BA 332.

BA 433 **3 cr. 3 hr.**
International Marketing
This course will concentrate on the marketing activities of firms operating in an international market. It will provide the student with an understanding of the factors that influence the selling of products in international markets. It will include the planning, organizing, and controlling of international marketing, along with its law, history, and economics.
Prerequisite: BA 230, BA 111, BA 220, BA 250, BA 330, and BA 332.

BA 434 **3 cr. 3 hr.**
Developing Marketing Strategies
Through the use of case studies and, where possible, cooperating businesses and nonprofit organizations, students will identify the pertinent marketing problems and opportunities, assess the organizations resources, and develop viable marketing programs. The course will include new product development and management strategies for effective marketing policies over the course of the entire product life cycle.
Prerequisites: BA 230, BA 111, BA 220, BA 230, BA 250, BA 330, and BA 332.

BA 440 **3 cr. 3 hr.**
Financial Management of Corporations
This course covers the analysis and management of the flow of funds through an enterprise. Cash management, source, and application of funds, term loans, types and sources of long term capital. Capital budgeting, cost of capital, and financial structure. It is an introduction to capital markets.
Prerequisite: BA 240.

***BA 460** **3 cr. 3 hr.**
Labor Law I
A course relating basic labor issues to the legal process. The study begins with a brief history of U.S. labor in the courts, tracing the development of national labor policy in the twentieth century, embodied in the National Labor Relations Act and in related federal law and regulation. The course then considers the role to the National Labor Relations Board and federal courts in determining whether labor organization conduct or employer conduct constitute unfair labor practices under the Act. The course relies mainly on primary materials, both state and federal court decisions, and administrative opinions.

***BA 461** **3 cr. 3 hr.**
Labor Law II
A continuation of BA 460.
Prerequisite: BA 460.

BA 470 **3 cr. 3 hr.**
Applied Software Development
As the capstone course in the MIS concentration, this course requires the student to apply concepts, principles, and problem solving techniques, strategies and tools learned in previous MIS and business courses to the development of a realistic computer based information system of medium complexity.

BA 490 Independent Study
Open to students who have permission of the supervising instructor and the department. Course of study, meetings, and credit by arrangement.

BA 493 **3 cr. 3 hr.**
Topics in Business
Courses having a more narrow focus or those taught on an irregular basis may be offered. New courses may be taught on an experimental basis under this title.

BA 497 **15 cr.**
Internship
This course is a full semester internship in either the private or public sector. The purpose of the course is to allow the student the opportunity to synthesize the theoretical learning of the classroom with a practical work situation.
Prerequisite: Permission of the department.

Chemistry

Chairman:
Daniel Robinson

Assoc. Professors:
Daniel Robinson

Asst. Professors:
Judith Ciottone
Pushkar Kaul
Lovell Agwaramgbo

The degree of Bachelor of Arts in Chemistry must include CH 110, 120, 200, 210, 300, 320, 330, 350, PH 130, 140; MA 230, 240 and at least three semester hours of Chemistry electives at or above CH 360. PH 210 is recommended for all Chemistry Majors and proficiency in German, French or Russian at the second year level is required for the Bachelor of Arts.

The Bachelor of Science in Chemistry must include CH 110, 120, 200, 210, 300, 320, 330, 350; CS 150, or CS 100 and one additional course approved by the Department; PH 130, 140; MA 230,240 and at least 3 semester hours of electives in Chemistry at or above CH 360. PH 210 is recommended. A minor in Chemistry consists of CH 200, 210, and 300 in addition to one course selected from CH 350, 320, 330, 360, 430 or 440.

*Asterisk indicates that the course is offered infrequently.

CH 100 **3 cr. 4 hr.**
Chemistry for Industrial Technology
The concepts of chemistry.

CH 110 **4 cr. 6 hr.**
General Chemistry I
The fundamental laws and theories of chemistry such as atomic structure, the periodic table, electrochemistry, descriptive inorganic chemistry, the gas laws, solutions, and chemical bonding. Chemical calculations are emphasized.

CH 120 **4 cr. 6 hr.**
General Chemistry II
Continuation of (and prerequisite): CH 110 or the equivalent.

CH 130 **4 cr. 5 hr.**
Chemistry I
Fundamentals of chemistry for non-science majors. This course is largely limited to inorganic concepts.

CH 140 **4 cr. 5 hr.**
Chemistry II
Continuation of (and prerequisite): CH 130 or the equivalent. It also involves a study of organic chemistry and biochemistry.

CH 200, 210 **4 cr. 6 hr. each**
Organic Chemistry I and II
Properties of organic compounds are discussed in terms of their molecular structures and reaction mechanisms. Recommended for chemistry majors, and or others contemplating graduate study and for those who feel the need for a solid theoretical foundation.
Prerequisites for CH 200: CH 110 and 120.

CH 240, 250 **4 cr. 5 hr. each**
Introduction to Organic Chemistry I and II
A survey of the major classes of organic compounds and their chemical andphysical properties. Reduced emphasis on theoretical foundations permits inclusion of topics in natural products, chemistry and bio-organic applications.
Prerequisites: CH 110 and 120.

CH 300 **4 cr. 6 hr.**
Quantitative Analysis
Emphasis on theory and application of Quantitative Analysis. The lectures stress chemical equilibrium, solubility product, complexometric formation, oxidation-reduction, and stoichiometric calculations.
Prerequisites: CH 110 and 120 or the equivalent.

CH 320 **4 cr. 6 hr.**
Physical Chemistry I
The underlying principles of chemistry from a physical chemistry standpoint. Kinetic theory, theories of the structure of matter, theory of electrolytic solutions, electrochemistry, thermodynamics, kinetics.
Prerequisite: CH 300 or the equivalent. Offered in alternate years.

CH 330 **4 cr. 6 hr.**
Physical Chemistry II
Continuation of (and prerequisite): CH 320. Offered in alternate years.

CH 350 **3 cr. 5 hr.**
Instrumental Analysis
Essentially a laboratory course in Instrumental Analysis including one hour lecture per week. Laboratory experiments include spectrophotometric, conducto metric, potentiometric, and chroma tographic analysis.
Prerequisite: CH 300 or the equivalent.

Advanced Topics Student and faculty availability determine the following course offerings.

***CH 360** **3 cr. 3 hr.**
Advanced Inorganic Chemistry
Valancy theories, acid-base theories, reactions in non-aqueous solvents, complexation and chelation, physical measurements.
Prerequisite: CH 320 or the equivalent.

CH 400 **3 cr. 6 hr.**
Natural Products Chemistry
Isolation, purification, and identification of pure compounds from a variety of naturally occurring substances. Special techniques will be introduced whenever feasible. Six hours of laboratory.
Prerequisites: CH 200 and 210.

CH 410 **4 cr. 6 hr.**
Biochemistry (See BI 410).
Prerequisite: CH 250 or CH 210.

***CH 420** **4 cr. 6 hr.**
Polymer Chemistry
An introduction to the synthesis and properties of macromolecules which also serves as an application of chemical principles to this interesting and important group of materials. Two hours of lecture and one four-hour laboratory period.
Prerequisites: CH 200 and 210 or the equivalent.

CH 430 **4 cr. 4 hr.**
Radiation Chemistry
Fundamentals of radiation chemistry, including radioactivity, atomic nuclei, nuclear reactions, activation analysis, reactors, and radiation detection and measurement with emphasis on the use of radioactive materials in chemical applications.
Prerequisites: CH 300, PH 140.

CH 440 **4 cr. 4 hr.**
Electrochemistry
Advanced course covering the theory and application of electrochemical cells, electrodes, analytical procedures, etc.
Prerequisite: CH 300.

CH 490 **1 to 3 S.H.**
Independent Study in Chemistry
Laboratory research under guidance of the Chemistry staff.
Prerequisite: Permission of the Instructor.

CH 493 **3 cr. 3 hr.**
Topics in Chemistry
Courses having a more narrow focus or those taught on an irregular basis may be offered. New courses may be taught on an experimental basis under this title.

CH 494, 495 **3, 6 cr.**
Internship
Assigned work in an industrial or government or private research laboratory to give experience in the students major.

Communications Media

Chairman:
Lee DeNike

Professors:
William Bowers
Lee DeNike
David Ryder

Assoc. Professors:
Peter Laytin
Helen Obermeyer-Simmons

Assist. Professors:
George Bohrer
Gunther Hoos
Ann Mrvica
Humphrey Regis

Instructors:
Jacqueline LaCoy
Larry Maness
Elliot Hoffman

The Communications Media Program is designed to integrate the theory and skills necessary for the design, production and evaluation of visual, electronic and printed media. Using an exceptionally well-equipped and sophisticated facility, the program prepares students for professional careers in several important fields: non-broadcast television production, photography, graphic design, motion picture production, and technical writing. Combined with a well-rounded education in the humanities, sciences and social sciences, Communications Media students culminate their course of study with a full semester of on-the-job experience in their chosen area of specialization.

The "Visions" Honors

Show Each May the Communications Media department mounts in the Campus Gallery its annual juried honors exhibit of the best student work. Communications Media students from all specialties enter their work. Photographs and graphics are displayed in the gallery, while films, videotapes and multi-image programs are shown in the campus screening room. The "Visions" show is an important recognition of the professional and artistic work done by Communications Media students.

Interdisciplinary Graphics Minor. See, Graphics.

*Asterisk indicates that the course is offered infrequently

Courses Designed for Communications Majors

Phase I

Theoretical

Phase I is the foundation of the program and is comprised of three required courses. Students are introduced to a variety of language and code systems used in print and non-print media. Other studies in this phase of the program include an introduction to the creation and interpretation of visual messages, the impact of mass media upon the individual and society, and the technology used to convey messages.

CM 110 **3 cr. 3 hr.**

Communication Theory

This is a broad-based introduction to the theory of communication and a comparative treatment of the sign systems or languages through which one communicates. Exploration of the various sign systems will serve as the vehicle for illustrating much of the communication theory relating to the media field.

CM 112 **3 cr. 3 hr.**

Message Design

An introduction to visual communication for the development of visual literacy for recognizing, making and understanding visual messages that are negotiable by all people. Students will become involved with a variety of activities in previsualization, planning, designing, making and evaluating visual messages. This course specifically relates to the communications specialties taught in Phase II: Television, Film, Graphic Design, Photography, and Technical Writing.

CM 113 **3 cr. 3 hr.**

Introduction to Communications Systems

A study of selected systems of communication. Focuses upon sources and development of ideas basic to these systems as well as the physical relationships in the encoding, decoding, and storage of communication transmission systems. Topics include electronic communication systems, film, graphics, photography, print, radio and television.

Phase II

Phase II courses are intended as introductory courses to the students' specialty and should be taken during the freshman year.

CM 230 **3 cr. 3 hr.**

Sound Production

A basic course in the theory and practice of sound recording and sound mixing for film and television. The course includes location and studio recording, sound editing, and multi-track sound mixing.

CM 232 **3 cr. 3 hr.**

Script Writing

A basic course in script writing for film, television and multi-image productions including preparation of proposals, treatments, storyboards, and scripts. The emphasis is on scripts for documentary and industrial programs.

CM 233 **3 cr. 3 hr.**

Color

An introduction to the basic principles of color as they relate to graphics, film, photography and television. Emphasis is given to color's physical, psychological and perceptual components.

Phase III

In addition to the stated prerequisites for individual courses in the phase, students must have completed all required Phase II courses prior to entering Phase III. Students should consult with their advisor regarding the appropriate basic technical development courses for their chosen specialty.

CM 340 **3 cr. 3 hr.**

Journalism

Readings in the mass media with individualized writing assignments. Some emphasis on the technical aspects of newspaper work. (Credit will not be given for both CM 340 and EN 280.)

Technical Writing Specialty

CM 341 **3 cr. 3 hr.**
Writing For Business and Technology
A study of writing for students interested in business, industry, and management. Includes business correspondence, description of process and mechanisms, sets of instructions, proposals, abstracts, reports, etc. (Credit will not be given for both CM 341 and EN 386.)

***CM 342** **3 cr. 3 hr.**
Feature and Magazine Writing
Writing feature articles for newspapers, magazine, and trade journals. (Credit will not be given for CM 342 and EN 387.)

***CM 345** **3 cr. 3 hr.**
Writing for Public Communication
Emphasis on fundamentals of writing for public communication; analysis of variables, viz., readability, color clarity, organization of material, flow, crispness. Customary forms used in the field including news releases, features, profiles, articles, editorials, manual copy. Further examination of institutional editor as creative interpreter of messages to numerous publics inside and outside the organization.
Prerequisite: CM 341.

***CM 346** **3 cr. 3 hr.**
Public Relations
Treatment of definitions and concepts, history, potential careers, research methods. Focus is on role of managed communications in public relations unique to industry, human services and education institutions.
Prerequisite: CM341.

Television Production Specialty

CM 350 **3 cr. 3 hr.**
Introduction to Television Production
Introduction to television production techniques using both studio and electronic field production (EFP). This course builds the technical and creative foundation for all subsequent television courses. Student purchase of videotape is required.
Prerequisites: CM 230, 232.

CM 351 **3 cr. 3 hr.**
Television Studio Production
This course is entirely studio based. All production is live-on-tape. Topics include: studio lighting, camera operation, technical directing, directing, studio sound recording and mixing as well as numerous other floor and control room operations. All students will direct and crew in class productions. Student's purchase of videotape is required.
Prerequisite: CM 350

CM 352 **3 cr. 3 hr.**
Interactive Video Production
This course provides the basic skills needed to produce and program for the computer interactive videodisc. Students write, flowchart, shoot and edit an interactive program on videotape. Then simulating videodisc operation, they program a computer to provide graphics, learning options and testing of this video material. Student purchase of videotape and floppy disk is required.
Prerequisites: CM 350, 351, 356.

CM 354 **3 cr. 3 hr.**
Advanced Television Production
This upper-level production-oriented course provides students the opportunity to produce portfolio quality work. Drawing on studio and EFP production techniques, students write, shoot and edit a sophisticated television program. Content may be industrial, documentary, commercial or dramatic. Student purchase of videotape is required.
Prerequisites: CM 350, CM 351, CM 356.

CM 355 **3 cr. 3 hr.**
Production Management
This course examines the fundamentals of production management: production budgets, production scheduling, contracts and agreements, union regulations for actors and crew members, shooting permits, legal implications and financial structures. This course maya be taken by televison or film students.
Prerequisites: CM 350, CM 351, CM 356, or CM 370, CM 371, CM 372.

CM 356 **3 cr 3 hr.**
Electronic Field Production (EFP)
Development of the skills necessary for non-studio on-location television production including: shooting and recording with color EFP equipment; location sound recording; location lighting; directing; electronic editing and other post-production techniques. Students are responsible for the purchase of videotape.
Prerequisites: CM 350

Photography Speciality

CM 360 **3 cr. 3 hr.**
Photography I
An introduction to the technical and aesthetic aspects of photography such as exposure techniques, film, paper, and basic 35mm camera work. Students are responsible for all paper and film supplies.

CM 361 **3 cr. 3 hr.**
Photography II
A continuation and refinement of the material covered in CM 360, Editing, sequencing and visual articulation are stressed. Students are responsible for all paper, film and mounting materials.
Prerequisite: CM 360.

CM 362 **3 cr. 3 hr.**
Photography III
An introduction to medium format photography, with advanced work in 35mm photography. Studio lighting and portraiture will be explored. Students are responsible for all paper, film and mounting materials.
Prerequisite: CM 361.

CM 363 **3 cr. 3 hr.**
Large Format Photography
This course will specialize in 4 x 5 photography and the use of the Zone System. Students are responsible for all paper and film supplies.
Prerequisite: CM 361.

CM 364 **3 cr. 3 hr.**
Color Photography
An introduction to color photography basic theory, C-prints, paper, and Chemistry. Students are responsible for all paper and film supplies.
Prerequisite: CM 361.

CM 365 **3 cr. 3 hr.**
Photo History
A survey of the development of photography to the present day.

CM 366 **3 cr. 3 hr.**
Photo Management
Students will be able to design a space for private, commercial and educational usage. Included will be an understanding of flow, function, equipment inventory, recordkeeping and budget control.
Prerequisites: CM 361

CM 367 **3 cr. 3 hr.**
Multi-Image Production
Development of skills necessary to plan, produce and present multi-image productions for industry, education and health care facilities. The course includes: scripting; photography; graphics; programming of up to nine slide projectors; sound recording and mixing, as well as the basics of effective multi-image presentation. Students are responsible for all supplies.
Prerequisite: CM 360

***CM 368** **3 cr. 3 hr.**
Bio-Medical Photography
Examination and practice with the current techniques in applying photography to the biomedical field. Students are responsible for all paper and film supplies.
Prerequisites: CM 362

CM 369 **3 cr. 3 hr.**
Photography Seminar
Advanced study in the medium. Students are responsible for all paper and film supplies.
Prerequisites: CM 362, or CM 363, or CM 364.

Film Production Specialty

CM 370 **3 cr. 3 hr.**
Film Production I
An introduction to the principles of filmmaking including the technical and creative aspects. Students are introduced to cameras, film stocks, exposure, lighting, composition, camera movement, cinematic storytelling and editing. As part of the coursework, students produce several short films in silent Super 8. Students are responsible for film purchase and processing.
Prerequisites: CM 230, 232

CM 371 **3 cr. 3 hr.**
Film Production II
This course adds sound in the form of single-system Super 8 production to the filmmaking process. Emphasis is on the production of several films for which sound must be recorded or created. Cinematographic, directing and editing skills are sharpened. Students are responsible for all film purchasing and processing.
Prerequisite: CM 370

CM 372 **3 cr. 3 hr.**
Film Production III
Film Production III teaches the fundamental skills of double-system film production — the methodology of all professional motion picture production. Using the most advanced double-system Super 8 equipment anywhere, students produce a sophisticated and professional film as their class project. Students are responsible for all film supplies.
Prerequisites: CM 370.

***CM 373** **3 cr. 3 hr.**
Advanced Production Seminar
Open to students specializing in film or television, this course deals with the role of the director and producer. Topics include: casting; directing professionals and nonprofessionals; working with talent agencies; hiring crews; production logistics, etc.
Prerequisites: CM 371 or CM 350.

***CM 374** **3 cr. 3 hr.**
16mm Production
This advanced course examines professional 16mm production and postproduction techniques. Topics include: film stocks; laboratories, lighting and grip equipment; 16mm and 35mm cameras; sound recording and editing; film editing; negative matching; interlock mixing and film-to-tape transfers. Students, as part of the course, produce a professional 16mm film. Film and processing costs are shared by all students.
Prerequisites: CM370 and permission of the instructor.

CM 377 **3 cr. 3 hr.**
Survey of Film
A study of the narrative and documentary films by American and foreign directors. Films will be screened in each class and discussed. Discussions and lectures will range from the artistic and cultural to the psychological and commercial aspects of films. Students will write several critiques and a term paper.

Graphic Design Specialty

CM 381 **3 cr. 3 hr.**
Graphic Design I
A problem solving approach to graphic design. The course involves projects with the physical and psychological aspects of graphic communication using graphic and typographic forms. Emphasis is on the effects of design on the communication process. Students are responsible for all graphic supplies. (Credit will not be given for both CM 381 and IT 381.)

CM 382 **3 cr. 3 hr.**
Graphic Design II
An examination of the relationship of graphic design to the changing socioeconomic forces in our society. This interrelationship is made evident through the process of solving specific related design projects. Problems are approached and solutions reached through teamwork and evaluated by joint critique. Students are responsible for all graphic supplies.
Prerequisite: CM 381.

CM 383 **3 cr. 3 hr.**
Graphic Design/Photography
Commercial applications of photography will be explored, including product presentation, advertising, illustration, promotion, and publication photography. The designer as a photographer will solve assigned problems using various techniques and materials including photo modification, various treatments, resin coated papers and Kodalith films. Students are responsible for all graphic supplies.
Prerequisites: CM 360, CM 382.

***CM 384** **3 cr. 3 hr.**
Graphic Management
A study of the theories and practices of advertising, sales, and marketing management in business, industry and education with emphasis on the graphic designer in the roles of creative art director, production manager, and designer illustrator.
Prerequisite: CM 382.

***CM 385** **3 cr. 3 hr.**
Display and Signage
A survey of the field of general display, P.O.P. display, signage systems, identifiers and other larger forms of graphic expression. Emphasis on clear communication of information, ease of recognizability, and coherence of designed systems. Problems will be taken through finished product or "mock-up." Students are responsible for all graphic supplies.
Prerequisite: CM 382.

***CM 386** **3 cr. 3 hr.**
Publication Design
An exposure to the design of text-intensive pieces. A discussion of effects of type choice on readability, use of white space, and methods of illustration are included. Problems involve copy casting, type selection, layout and design of multi-paged work, and choice of format and illustration. Students are reponsible for all graphic supplies.
Prerequisites; CM 382, CM 388, or permission of Instructor.

***CM 387** **3 cr. 3 hr.**
Package Design
A study of the graphic processes in three-dimensional packaging with emphasis on the various materials and display requirements. Students will investigate letterpress, offset, and silk screen processes. Students are responsible for all graphic supplies.
Prerequisite: CM 382.

CM 388 **3 cr. 3 hr.**
Typography, Comprehensives and Mechanicals
An in-depth study of letter forms from ancient through modern photo-modified type. Projects involve the whole process from rough design, through comprehensives, to "camera-ready" mechanicals. Students are responsible for all graphic supplies.
Prerequisites: CM 381, CM 382.

CM 389 **3 cr. 3 hr.**
Electronic Graphic Design
An introduction to the techniques and tools utilized to create, manipulate and organize the graphic image through the use of electronic media. This course will demonstrate present and future applications of electronically generated images as they relate to the graphic designer. Students will have hands-on experience with computer and television technology as well as presentations of relevant topics.
Prerequisite: CM 382.

CM 390 **3 cr. 3 hr.**
Graphic Design III
Advanced study in graphic design concentrating on technical and creative illustration. Students will work in various media including pen and ink, watercolor, marker and airbrush.
Prerequisite: CM 382.

CM 391 **3 cr. 4 hr.**
Graphic Arts Production
This course provides the skills necessary to produce printed products. Students will complete projects in computer aided design, utilize CRT typesetters, operate process cameras, prepare printing plates, precisely match ink colors and print their projects. The very important relationship between the designer and the commercial printer will be emphasized. (Credit will not be given for both CM 391 and IT 391.)
Prerequisite: CM 381 or permission of Instructor.

CM 392 **3 cr. 3 hr.**
Advanced Electronic Graphic Design
An advanced course in computer graphics. The course covers application of electronically generated images as they relate to the graphic designer and the use of computer graphics work stations. Topics of study include: digital typography, illustration systems, television graphics, computer layout and pagination, package design and presentation graphics.
Prerequisites: CM 381, 382, 389 or permission of the instructor.

Phase IV

CM 420 **3 cr. 3 hr.**
Human Communications Technology
A study of the human relations problems associated with the introduction of communications technology into industry, business, schools and other public or private agencies. Students conduct an intrapersonal and interpersonal self-inventory to identity those qualities and skills which should be stressed and those which need improvement for shaping their communication with people who may have different attitudes and values toward a particular technology. An in-depth study of the application of communications technology in an assigned corporate or business setting will be conducted.
Prerequisite: Completion of all Phase I and Phase II courses. This is a senior level course.

CM 422 **3 cr. 3 hr.**
Organizational Communication
An examination of the organizational and management procedures used as vehicles for communication within business and educational institutions.
Prerequisite: Completion of all Phase I and Phase II courses.

CM 423 **3 cr. 3 hr.**
Communications Law and Ethics
This course is an introduction to communications law and media ethics. Issues raised in the course are important for all students in the Communications/Media department. Topics include: copyright law, libel, the fairness doctrine, cable and broadcast law, privacy, as well as a discussion of the U.S. legal process. Guest speakers and field trips augment classroom discussions.
Prerequisite: Completion of all Phase I courses.

CM 488 **12 cr.**
Practicum
A full semester on-or off-campus internship requiring 15 36-hour weeks of work in which Communications Media majors apply their knowledge and skills to the practical solution of communications problems.

Prerequisites: Completion of all Phase I, II, III and IV Communications Media courses with an average cumulative Communications Media grade point average of 2.5 or better. Approval by Communications Media Practicum Committee.

CM 490 Independent Study
Independent Study provides the opportunity for highly self-motivated students to explore areas of Communications Media not provided within the departmental curriculum. Projects qualifying for independent study credit may involve production, photography, design, research or the writing of an extended monograph. Approval by the sponsoring faculty member and permission of the department chairperson is required.

CM 493 **3 cr. 3 hr.**
Topics in Communications/Media
Courses having a more narrow focus or those taught on an irregular basis may be offered. New courses may be taught on an experimental basis under this title.

Computer Science

Chairman:
Aparna Ramanathan

Assoc. Professors:
William Brown
Robert McGuire
Robert Shaughnessy

Professor:
Theodore Lapierre

Asst. Professors:
Frank Archambeault
Gerald Johnson
Frits Lander
Aparna Ramanathan
Charles Wilson

Instructors:
Michael Burke
Diana LaFalam

The Computer Science Program provides for students to develop a unique blend of knowledge and skills in the areas of computer software, computer hardware, and mathematics. The program is designed to prepare students for positions within organizations that design and construct hardware and/or software systems and as such is oriented to software and hardware engineering. The Degree of Bachelor of Science in Computer Science must include: CS 150, CS 155, CS 160, CS 165, CS 250, CS 260, CS 280, CS 365, MA 230, MA 240, PH 130, PH 140 plus an additional 15 S.H. of Computer Science Electives, 6 S.H. of Math electives above MA 240.

A minor in Computer Science consists of the following four courses: CS 150 Intro. to Computer Science CS 155 Data Structure CS 280 Assembly Language Programming CS 320 Programming Languages and two additional computer science electives (6 semester hours). It should be noted that enrollment in the Computer Science minor is limited.

Interdisciplinary Graphics Minor See, Graphics.

*Asterisk indicates that the course is offered infrequently.

CS 100 **3 cr. 3 hr.**
Introduction to Programming
This course provides an opportunity to learn a higher level programming language, to gain experience in the design, coding and utilization of computer programs andto gain insight into the responsibilities that humans have when they are involved with computers.

Topics include: the syntax and semantics of a higher level programming language, the design, coding, testing and application cycle, application areas, man-machine interrelationships. Several programming assignments are included.

Prior to enrolling in this course, the student should have working knowledge of high school algebra. (CS 100 does not carry credit toward a Computer Science major.)

CS 150 **3 cr. 3 hr.**
Introduction to Pascal
An introduction and foundation for further study in Computer Science and more specialized programming language courses. Students design programs using a top-down modular approach and code programs using a structured style. They should be well prepared to enroll in more specialized higher level programming language courses.

CS 155 **3 cr. 3 hr.**
Data Structures
This course presents the most common methods of organizing information to be used in problem solving and emphasizes algorithm, development and programming style. Using the programming language Pascal, the student will practice the structured programming techniques introduced in earlier courses.

After taking this course, the student should have a firm foundation in computer science and ability to solve a wide variety of programming problems. The student will have been introduced to the "science" of computer science, as opposed to the "coding" of computer programming.

The data structuring techniques studied will include: arrays, records, sets, linked lists, and trees. The structured programming concepts studied will include: loopinvariants, data abstraction, step-wise refinement, and top-down programming. Particular attention will be spent on the interaction between data structures and storage structures and the trade-offs involved in data structure selection.
Prerequisite: CS 150

CS 160 **4 cr. 5 hr.**
Introduction to Electronics
An introduction to modern solid state devices and circuits. These include: diode rectifiers, power supply design, OP amps, and oscillator circuits. Extensive laboratory work illustrates the operation and behavior of circuits as well as the use of modern laboratory test equipment.

Topics include: semiconductor principles, diodes, circuits, power supply design, bipolar and FET transistor applications, OP amp circuits and applications, oscillators, and linear integrated circuits. Weekly laboratory sessions are included.
Prerequisites: PH 240, MA 230 (or concurrent).

CS 165 **4 cr. 5 hr.**
Digital Electronics
A study of the design and application of electronic logic circuits including an analysis of sequential logic circuits using Boolean algebra and Karnaugh maps. Counters, registers, serial and parallel adders and arithmetic units are included.

The topics in the course include: Boolean algebra, algebraic simplification, Karnaugh mapping, Quine McCluskey method, combinational logic circuits, sequential logic circuits, comparison of TTL, MOS ECL logic families, the arithmetic unit, coding and decoding, parity detection and generators, multiplexers, demultiplexers. Extensive laboratory work supplements the topics studied. Before taking this course the student should have an understanding of topics covered in a basic electronics course, including the operation of diodes and transistors, amplifiers, and oscillators.
Prerequisite: CS 160.

CS 200 **3 cr. 3 hr.**
Computer Graphics for Non-Computer Science Majors
This course is designed to teach non-computer science majors the fundamentals of graphics programming using Turbo Pascal on the AT&T computer. The student will write programs demonstrating mastery of the following graphics techniques: rotation, scaling, translation, clipping, windowing, graphing, and animation.
Prerequisites: CS 150, CS 155, or permission of the instructor.

CS 250
Fortran with Introduction to Numerical Methods
An in-depth study of the programming language FORTRAN with emphasis on numerical methods. This course is an advanced programming course and assumes a knowledge of structured programming. Elements of numerical methods are introduced and integrated concurrent with appropriate programming topics and/or problem solving situations.

This course provides a solid background for applications in graphics, simulation, engineering, and business. A substantial number of programming assignments are included.
Prerequisites: CS 155, MA 230, with MA240 recommended.

CS 260 **4 cr. 5 hr.**
Computer Organization
An analysis of digital computers in terms of their hardware and the interaction of the hardware and software within the machine.

Topics include: machine language programming, core memories, RAMS, ROMS, PROMS, methods of magnetic recording on tape, discs, ASCII coding, a typical minicomputer, bus structure, time, control, organization of a typical microprocessor, the 6800.
Prerequisites: CS 165, CS 280.

CS 270 **3 cr. 3 hr.**
COBOL-I
An introduction to the COBOL programming language and top-down program design using the ideas of structured programming. Some of the techniques used to process business data are covered.

Students design and code COBOL programs for the solution of problems requiring multiple fixed and or variable length records for sequential files. Course content includes: Cobol, identification, environment, data and procedure divisions, problem definition, output format design, input data, record and file design, top-down program design, arithmetic and logical operations, sequential disk files, table-handling, and a substantial number of programming projects.

Before taking this course, the student should have had experience programming with a higher level language and be aware of the function of the major hardware and software components of a digital computer system. Those students desiring working knowledge of COBOL beyond the introductory level should consider CS 275 as a successor course to CS 270.

***CS 275** **3 cr. 3 hr.**
COBOL-II
A study of the facility of COBOL for table and file handling with particular attention to indexed sequential files and variable length records. It is intended for those students interested in becoming able to make substantial contribution in the area of business data processing.

After completing this course, the student should be able to design and code a modest system of programs and provide substantial assistance in the design and coding of larger programming systems.

Topics include: sorting and merging files, table handling, variable length records, indexed sequential access method, file creation, updating and reporting. Includes a substantial number of programming projects.

Before taking this course, the student should have experience that substantially includes the methods and activities of COBOL-I (CS 270).

CS 280 **3 cr. 3 hr.**
Assembly Language Programming
A study of the basic operation of a computing system at the assembly language level. A detailed knowledge of an assembly language and an enhanced understanding of higher level languages are course objectives.

One of the available computer systems will be selected for an in-depth study and for programming applications. The course content will include: console operation, loading routines, numberical and character representations, mnemonic operations, instruction formats, location counters, relocation, literals, error flagg, addressing modes, parameter passing, subroutine linkage, macros, conditional assembly, device controllers, character-to-integer conversion, and simple data structure realizations.
Prerequisite: CS 155

CS 290 **3 cr. 3 hr.**
Numerical Methods for Digital Computation
This course provided the student with a study of basic algorithms used in scientific computer work and affords an opportunity to apply related programming techniques using a digital computer. The emphasis is placed upon building algorithms for the solution of numerical problems, the sensitivity of these alogrithms to numerical errors, and the efficiency and accuracy of these algorithms on various computers. The student is expected to complete a number of computational projects using suitable procedure-oriented programming languages.
Prerequisites: MA 240, CS 155, CS 250, one additional procedure-based programming language (e.g. Pascal or "C").

***CS 300** **3 cr. 3 hr.**
Interactive Computer Graphics I
Programming device independent graphics and windowing, clipping, segmentation, viewpoints, panning, zooming. Interactive devices implementation of software. Mathematical aspects are 2D and 3D transformations, projections, hidden line ellimination, viewing in 3D. Consideration of Advanced Display Architecture, Raster Algorithms, Shading, Intensity, Color. Prerequistes: CS 155, CS 280, CS 260, MA 240.

CS 310 **3 cr. 3 hr.**
Operating Systems
This course analyzes the structure and operation of modern operating systems with emphasis on the layered, or levels of abstraction, approach to their design. Major topics include: management of processes, primary and auxiliary storage, processor, and

network interaction. A variety of data models and algorithms are explored in the process of defining the operating system kernal and hardware and CPU features are elucidated. Operating systems studied include: UNIX, VAX/Vms, CPM, MS-DOS, OS-9, and VRTX.
Prerequisites: CS280, CS260

CS 330 **3 cr. 3 hr.**
Simulation I
The purpose of this course is to introduce the art and techniques of system simulation.

Topics include: Theory of system simulation, design of system simulation models, Monte Carlo Technique. Higher-level programming languages (FORTRAN and/or PASCAL) and a discreet system simulation language (GPSS) are used. Several programming assignments are included.
Prerequisites: CS 250, MA 240

CS 340 **3 cr. 3 hr.**
Data Communications/Networking
This course examines local network technology and architecture through basic data communications principles, newly developed concepts, and practical hands on experience. All networking fundamentals will be presented based on the modular approach of the ISO standards. Network models to be studied will include the local area network (LAN), the high speed local network (HSLN), and the digital switch/digital private branch exchange (PBX). Student projects will give additional experience with data communications using modems, and AT&T's Information Systems Network (ISN) and both DOS and UNIX computer systems. Protocol development and complex mesh networks will also be studied.
Prerequisite: CS 250, SC 260, CS 280

CS 360 **4 cr. 5 hr.**
Microprocessor Applications I
The student will investigate the techniques by which microprocessors may be linked to the physical signals of the real world. Topics to be studied include transducers, signal conditioning, analog to digital conversion, digital to analog conversion, nyquist criteria, signal processing software, and data communications techniques. Theory will be applied in corresponding laboratory work which will include a complete design project. Commercial microcomputer development systems will be discussed and used as a design aid.
Prerequisites: Microprocessor Lab, and Assembly Language programming.

CS 365 **4 cr. 4 hr.**
Microprocessor Laboratory
A detailed study of the microprocessor, and some if its applications. Emphasis is placed on the Motorola 6800, its hardware and software, and its associated family of integrated circuits in addition to the Intel 8085 microprocessor.

Students design a microprocessor system, configuring the random access memory, the read-only memory, peripheral devices using peripheral interface adaptor, as well as the combinational logic for the address decoding. The student will write software to control peripheral devices and program EPROMS for the control sofware.

The contents of course include: 6800 microprocessor, peripheral devices, instruction set, addressing modes, programming EPROMS, short introduction to the 8085 microprocessor.

Before taking the course, the student should be thoroughly familiar with digital electronics, and have some understanding of assembly language programming.
Prerequisites: CS 260, CS 280

CS 400 **3 cr. 3 hr.**
Interactive Computer Graphics II
A continuation of Interactive Computer Graphics I with focus on modern display architecture, 3D models and splines hidden edges and surface removal, shading, color and intensity, introduction to Image Processing.
Prerequisites: CS300

CS 320 **3 cr. 3 hr.**
Programming Languages
A study of algorithmic and symbolic programming languages. Languages are selected for study based on their current/predicted importance as well as their features that support fundamental aspects of software engineering. Typical of the languages

Prerequisites: CS250, CS280

CS 401 **3 cr. 6 hr.**
Computer Graphics III
Advanced topics in computer graphics, including 3D Realism, image processing (storage and manipulation), object recognition and graphic standards.
Prerequisites: CS 400, MA 340.

CS 420 **3 cr. 3 hr.**
Compiler Construction
A study of the techniques involved in the analysis of source language code and the generation of efficient object code.

This course focuses more on the front end of the compiler (analyzer) than it does the tail end (or generator). Topics include: language definition, lexical, syntatic and semantic analysis, code generation. Students working in small project teams modify an existing compiler. Several programming assignments are included.
Preprequisites: CS 250, CS 280, CS 260 with CS 320 recommended.

CS 430 **3 cr. 3 hr.**
Simulation II
This course continues the topics which were introduced in Simulation I. The course content will include: probability concepts in Simulation, queueing theory, introduction to SIMSCRIPT, simulation programming techniques, and analysis of simulation outputs.
Prerequisite: CS 330

CS 440 **3 cr. 3 hr.**
Software Design
This course provides the student with an opportunity to obtain practical experience in developing and implementing software systems. Students work in project teams and apply principles of structured design and coding toward the solution of assigned problem(s).

The software projects undertaken in this course will vary and interested students should consult with the course instructor prior to enrolling.
Prerequisites: Completion of Computer Science Core courses plus permission of instructor.

CS 460 **3 cr. 4 hr.**
Microprocessor Applications II
The students will study advanced topics in microprocessor applications. An advanced project will be assigned to each student at the beginning of the course. Extensive use will be made of commercial microcomputer development systems to assist in the design of the student project.

Upon successful completion of this course, the student should have completed an advanced project developing a microprocessor controlled system for a particular application. Evidence for completion will include a comprehensive written report as well as an oral presentation demonstration.
Prerequisite: CS 360.

CS 465 **3 cr. 5 hr.**
Robotics I
An investigation of the mechanical, electrical, sensing, and control problems that must be solved to make a robot work in a particular application.

Robotic software will be developed, and a laboratory robot will be used to demonstrate applications. The robot will have sensors to provide input data and robot behavior will be modified according to data received.
Prerequisite: CS 260.

CS 467 **3 cr. 7 hr.**
Advanced Assembly Language
An advanced programming course designed to develop a complete and integrated system of hardware interfacing and data analysis in a computer laboratory environment.
Prerequisites: CS 280, CS 260.

***CS 470**
Programming Practicum
This course provides an opportunity for a student, working under the direction of a participating faculty member to study or conduct research in an area not covered in other courses.

Typical areas of study include: computer graphics, compilers, operating systems, computer-aided instruction, microprogramming and data structures. The background required of the student,prior to taking this course, depends entirely on the particular area of study or research. Permission of the instructor is required.

CS 490
Independent Study
Open to students who have permission of the supervising instructor and the department. Course of study, meetings, and credit by arrangement.

***CS 493** **3 cr. 3 hr.**
Topics in Computer Science
The objective of this course is to study a topic of current interest in computer science. This course serves as a vehicle for curriculum experimentation and/or enrichment.

After completing this course, the student should have an understanding of some current advance in computer science and/or greater understanding of a particular topic that is of current interest.

The background required of the student, prior to taking this course, depends upon the topic, but generally a background equivalent to about five prior computer science courses would be the minimum expected.

CS 494, 495, 496 **3, 6, 12 cr.**
Internship

Economics

Professor: *Caroline Murphy*
Assoc. Professor: *Nancy Wiegersma*

Asst. Professors:
Alex Donkor
Michael Turk

The degree of Bachelor of Science in Economics requires Principles of Economics: Macroeconomics and Microeconomics (EC 100, 120), Intermediate Macroeconomics and Microeconomics (EC 366, 365), Money and Banking (EC 140), History of Economic Thought (EC 300), Applied Statistics I (MA 170), Calculus for Business (MA 220), and at least 9 hours of electives in Economics.

Students who wish to transfer into the Economics major from another major in the college or from an Undeclared status must have a 2.5 cumulative average.

A minor in Economics consists of EC 100 and 120 in addition to four courses selected from EC 130,140, 150, 160, 300, 320, 340, 350, 360, 365, 366, 370, 490, and GE 300.

*Asterisk indicates that the course is offered infrequently

EC 100 **3 cr. 3 hr.**
Principles of Economics: Macro-economics
This course is a study of the theory of employment, income and growth. Stabilization policy and current problems in American capitalism are emphasized.

EC 125 **3 cr. 3 hr.**
Introduction to Economics
This course is an introduction to economics course for non-majors.

EC 120 **3 cr. 3 hr.**
Principles of Economics: Micro-economics
Students examine the theory of the consumer and the business firm. Efficiency in the allocation of resources is examined in four different market structures: pure competition, pure monopoly, monopolistic competition and oligopy.
Prerequisite: EC 100.

EC 130 **3 cr. 3 hr.**
Consumer Economics
This course emphasizes theories of consumption and economic functioning, demand, consumer problems, standards of living, policies for protecting consumers and expanding consumption.

EC 140 **3 cr. 3 hr.**
Money and Banking
This course focuses on the role of money, credit and banking in the American economy. Special emphasis is placed on the applicability of monetary policy to the problems of economic stability.
Prerequisite: EC 100.

EC 150 **3 cr. 3 hr.**
Economic Development
This course examines the problems of growth with particular reference to less developed countries; topics of discussion include population, income growth, capital formation, unemployment, foreign investment and aid, and the role of government. Investigation through case studies is emphasized.
Prerequisite: EC 100.

EC 160 **3 cr. 3 hr.**
Public Finance
This course studies the principles of governmental expenditures and revenues. Attention is also devoted to the problems of public debt, fiscal policy, and inter-governmental fiscal relations, with particular reference to the United States.
Prerequisites: EC 100 and EC 120.

EC 300 **3 cr. 3 hr.**
History of Economic Thought
This course covers the work of the great economists within the framework of understanding the relationship between history and economic thought. From the roots of economic thought in the works of the merchantilists and physiocrats, the course turns to the giants in political economy: Adam Smith, David Ricardo, Karl Marx, Alfred Marshall, J. M. Keynes.
Prerequisite: EC 100.

EC 310 **3 cr. 3 hr.**
Economic Geography
This course is an analysis of factors underlying the spatial distribution of primary, secondary, and tertiary economic activities, with emphasis on locational processes in commercial economics. (Co-listed as GE 300.)

EC 320 **3 cr. 3 hr.**
Comparative Economic Systems
This course studies the different economic systems operational in the world today. Emphasis is on differences between market or capitalist systems and socialist systems. The centrally planned economies are considered as well as the social democratic economies of Northern Europe.
Prerequisite: EC 100.

EC 340 **3 cr. 3 hr.**
Human Resource Economics
Labor market and employment analysis are the focus of this course which covers the structure of labor markets, the education and training of the labor force, and manpower programs. The serious problems of unemployment, underemployment, discrimination and barriers to job entry are also discussed.
Prerequisite: EC 100 and EC 120.

EC 350 **3 cr. 3 hr.**
Urban Economics
This course is an historical and economic explanation of the growth of cities as well as a theoretical analysis of their location, form, and economic structure. Current urban economic problems are also discussed.
Prerequisite: EC 100 and EC 120.

EC 355 **3 cr. 3 hr.**
International Economics
This course explores the theories of international trade and finance, and their links to theories of economic development. Major current topics in the international economy, including economic competition among developing countries, debt problems in the Third World, and North-South relations, are treated as practical issues against which the theories can be tested.
Prerequisites: EC 100 and EC 120.

EC 365 **3 cr. 3 hr.**
Intermediate Macroeconomics
As a second course and more advanced treatment of macroeconomics, this course provides a detailed examination of major topics in macroeconomics, including theories of consumption, investment, and growth and recession, and efforts by the government to stabilize the economy through fiscal, monetary, or other measures. This course introduces the Keynesian, neo-classical, and Marxian models of the macroeconomy.
Prerequisites: EC 100 and EC 120.

EC 366 **3 cr. 3 hr.**
Intermediate Microeconomics
This course analyzes consumer and producer equilibrium in a market economy. The behavior of firms in the four market structures and the behavior of firms and individuals in input markets are examined. Applications of economic theory to concrete economic problems are emphasized.
Prerequisites: EC 100 and EC 120.

EC 370 **3 cr. 3 hr.**
Econometrics
This course is an introduction to econometric methods, statistical inferences and testing hypotheses. Model building techniques and their theoretical justification are presented and evaluated in terms of their performance and EC 490

Education

Chairman: George Miller

Professors:
Patricia Barbaresi
Howard Kingsley
Robert Lee
Elizabeth Ross

Assoc. Professors:
Anne Green
Robert Greene
George Miller
Helen O'Flaherty
Judith Schifferle

Asst. Professors:
Rona Flippo
Irene Passios
William Strader

The Early Childhood, Elementary, and Secondary Education Department provides students with five curriculum options leading to the degree of Bachelor of Science in Education:

1/Early Childhood Education (Track I, K-3)

2/Early Childhood Education (Track II-Teacher of Young Children with Special Needs, ages 3-7)

3/Elementary Education (1-6)

4/Middle School Education (5-9)

5/Secondary Education (9-12)

All teacher education candidates must satisfy the Constitution requirement of the Commonwealth of Massachusetts. See, "Common Graduation Requirements..."

Early Childhood Education (Track I, K-3) This track prepares students to become teachers of children in day care centers, nursery programs, kindergartens and first, second, and third grades. A graduate is eligible for Massachusetts certification as an Early Childhood Teacher.

The degree of Bachelor of Science in Education, Early Childhood, must include ED 100, 210, 211, 220, 240, 310, 311, 384, 385, 405; PY 110.

Early Childhood Education (Track II, Teacher of Young Children with Special Needs, ages 3-7)

This track prepares students to become teachers of young children (ages 3-7) who have special needs. Graduates are eligible for Massachusetts certification as a Teacher of Young Children with Special Needs. This program represents the combined resources of the Early Childhood component of the ECES Education Department and the Special Education Department. The selection process for this track takes place near the conclusion of the freshman year. Practicum experiences are required in both a special needs classroom and a regular classroom.

The degree of Bachelor of Science in Education for the Teacher of Young Children with Special Needs must include ED 100, 210, 211, 220, 240, 270, 310, 311, 384 or 385, 405; SE 200, 251, 410, 350 (section II), 388, 390. SE 210 and 340 are recommended for students in ECE Track II.

Elementary Education (1-6) The Elementary Education Program prepares students to become teachers of children in grades one through six. A graduate is eligible for Massachusetts certification as an Elementary Teacher.

The degree of Bachelor in Science in Education, Elementary, must include AR 100 or 120; BI 181; ED 300, 303, 304, 305, 350, 360, 386, 410; EN 290; MA 100 or above, 283; MU 100; PY 110, 221, 275, SE 405.

All elementary majors must select and complete a second academic major or an academic minor or an academic specialization in one of the following areas: Art, Behavioral Sciences, English, Foreign Language, Geography, History, Mathematics, Music, Physical Education, or Science. Requirements for a second academic major or an academic minor are as determined by the respective academic departments. Requirements for an academic specialization are a minimum of 15 semester hours selected from one of the areas listed above in consultation with and with the approval of the ECES Education departmental advisor and the respective academic department. The department requires 15 semester hours in Art, 24 in Behavioral Sciences, 18 in English, 15 in Foreign Languages, 15 in Geography, 15 in History, 21 in Mathematics, 15 in Music, 18 in Physical Education, and 15 in Science.

The Minor in Elementary Education

The minor in Elementary Education consists of 18 semester hours:
ED 300
Principles and Practices of Elementary Education
ED 304
Foundations of Education
ED 303
Reading in Elementary Education
MA 283
Methods and Materials in Elementary Mathematics or
BI 181
Science in Elementary Education

Two of the following courses:

ED 350
Creative Arts in Elementary Education ED 410
Language Arts in Elementary Education SE 405
Issues in Mainstreaming

The minor of 18 s.h. is NOT intended to and does not meet Massachusetts certification requirements for elementary school teachers.

Before applying for this minor, the student should have successfully completed PY 221 Child Psychology.

Secondary Education (5-9, 9-12) Secondary Education The Secondary Education Program prepares students majoring in Biology, English, Geography, History or Mathematics to become secondary school teachers in grades five through nine and nine through twelve. Graduates are eligible for Massachusetts Certification as a Teacher of Biology (9-12), Earth Science (9-12) English (9-12), Geography (9-12), History (9-12), or Mathematics (9-12).

The course requirements for the degree of Bachelor of Science in Education, Secondary, in Biology, English, Geography, History, and Mathematics are to be found under each of the above majors in this catalog.

The Minor in Secondary Education

The minor in Secondary Education consists of 30 semester hours as follows:

PY 223
Adolescent Psychology
ED 301
Successful Practices in Secondary Education
EN 470
Teaching Writing to Secondary Students
ED 364
Reading in the Secondary School
(English majors only)
PY 275
Tests and Measurements
BI 485, EN 485, GE 485, HI 485, MA 485 or ED 485
Special Methods of Teaching in the Modern Secondary School
BI 486, 487
Biology Student Teaching
EN 486, 487
English Student Teaching
GE 486, 487
Geography Student Teaching
GE 488
Student Teaching in Earth Science
HI 486, 487
History Student Teaching
MA 486, 487
Math Student Teaching

The minor of 30 s.h. does meet Massachusetts certification requirements for secondary school teachers. It includes all of the various departmental requirements of our secondary majors. The student is eligible for Massachusetts certification to teach in grades 9-12 in Biology, English, Geography, History, or Math or grades 5-9 in Geography. Because these programs have been approved by the Massachusetts Board of Education graduates are assured initial certification upon application in states under the Interstate Certification Compact.

ED 010 **1 cr. 3 hr.**
Personal Reading Improvement
Individualized reading programs are tailored to meet the particular needs of each student. Students experiencing difficulty in understanding what they read engage in programs stressing comprehension skills. Students with good comprehension but with slow reading rates receive assistance in acquiring skills to at least double their speed. Additionally, all students are given instruction in reading at different rates for different purposes.

Students are free to select any three hours in the week-from 8:30 a.m. to 4:30 p.m. One credit per semester.

ED 020 **1 cr. 2 hr.**
Personal Reading Improvement II
Continuation of Personal Reading Improvement I.

ED 100 **4 cr. 5 hr.**
Early Childhood Foundations
This course gives a brief orientation on the developmental philosophy and goals of early childhood education. Students will consider educational procedures used in facilitating the development of the child, explore the role of the teacher, the environment and the appropriate instructional strategies used with young children. Required of all Early Childhood majors.

ED 210 **4 cr. 5 hr.**
Reading in Early Childhood Education
The reading process and factors influencing the development of reading will be examined. Prereading and reading skills will be identified and techniques for assessment of skills will be presented. Methods and materials for teaching primary reading will be discussed and illustrated. A practicum in the reading area is required.
Prerequisite: ED 211.

ED 211 **4 cr. 5 hr.**
Behavioral Science in Early Childhood I: Child Development and Observation
This course includes a study of principles, patterns, and theories of human development and learning as well as principles and techniques of naturalistic and standardized child study. Observation, recording, synthesis, and interpretation of the behavior of young children will occur within a practicum setting. Case studies will be written. Required of Early Childhood majors.
Prerequisite: General Psychology or Introduction to Psychology. Required for ED 311.

ED 220 **4 cr. 5 hr.**
Language Arts in Early Childhood Education
This course covers an examination of the four components of verbal communication-listening, speaking, reading, writing; current materials and programs for developing language; use of literature in language and concept development; practicum for application of learning.

ED 240 **4 cr. 5 hr.**
Fine Arts in Early Childhood Education
This course studies the integration of art, music and movement for young children using an interdisciplinary approach. Investigation of the objectives, methods and materials in the fine arts is conducted.

ED 250 **4 cr. 5 hr.**
Pre-Kindergarten Clinical
This course provides an opportunity for those interested in working with prekindergarten age children to create a learning environment using will be explored.

ED 270 **4 cr. 5 hr.**
Parent-Child Relations in Education
This course explores the role of the parent in the development of the child and how the parent relates to the educational system. This course will stress awareness of how parents stimulate the growth of behavioral trends in their children, as well as their usefulness as resources to improve the educational environment of the child.
Prerequisite: ED 211 or Child Development.

ED 280 **15 cr. 45 hr.**
Integrated Creative Arts Teacher Education Program
This is a full-semester experience which includes five weeks of classroom instruction and training (creative work in visual arts, language arts, movement, music, and integrating art forms). Subsequent to the initial period, students will be placed in field stations for classroom experiences for the remainder of the semester. These activities will involve assisting teacher-specialists in one or more of the art form areas,and the development and implementation of programs for the specific classroom and its pupils so as to foster the pupils personal expression through creation in the arts.
A weekly seminar on Wednesday afternoons from 1:00 to 3:00 will be held at the College for the purposes of workshop experiences and problem solving. Students are expected to be present in the school throughout the semester. They will be visited and evaluated regularly by College faculty as well as by cooperating teacher-specialists in the schools.

ED 300 **3 cr. 3 hr.**
Principles and Practices of Elementary Education
This course includes an examination of the theoretical and practical knowledge of the teaching/learning process. Students demonstrate competencies in the areas of planning, curriculum design, and evaluation. Focus is placed on the needs and learning styles of the elementary school child and the instructional strategies used to effectively meet those needs. In addition, classroom management skills and techniques are emphasized. A field experience is an integral part of the course.
Prerequisite: PY 221.

ED 301 **3 cr. 3 hr.**
Successful Practices in Secondary Education
This course provides an opportunity to experience many teacher roles at the secondary school level. The student serves as a tutor in a public school, develops curriculum and instructional material, and designs, presents, and critiques a micro-lesson.

ED 303 **3 cr. 3 hr.**
Reading in Elementary Education
This course includes an examination of the reading process, methods of evaluation and strategies for reading. Reading skills and procedures for developing these skills are examined and current approaches to the teaching of reading are evaluated. The student will be made cognizant of methods of grouping and evaluation procedures. A practicum is required.
Prerequisite: PY 221, Ed 300.

ED 304 **3 cr. 3 hr.**
Foundations of Education
This course covers a study of the professional aspects of teaching, the school's role in society, the organization and support of American education, the historical foundations of education and its philosophical bases. Issues affecting curriculum development and the future of American education are considered.

ED 305 **3 cr. 3hr.**
Reading Diagnosis and Remediation
This course provides students with the competencies necessary to diagnose reading abilities and to develop reading proficiency in their own future classrooms, and the skills of administering, scoring, and analyzing Informal Reading Inventories. The student will test a child, plan a program of instruction for that child, and instruct the child based on the diagnosis and instructional plan. Emphasis is also placed on the development and utilization of assessment strategies, instructional techniques, and instructional activities specific to the needs and interests of the child.
Prerequisite: ED 210 and ED 303.

ED 306 **3 cr. 3 hr.**
Methods and Materials in Early Childhood Education
This course includes a hands-on workshop and exploration of all areas of the curriculum. In doing so students will research and prepare games and devices appropriate to an early childhood classroom. Elective for all education majors.

ED 310 **4 cr. 5 hr.**
Science, Math, and Social Studies in Early Childhood Education
Emphasis is placed on the development and demonstration of instructional techniques and materials in science, math, and social studies that are appropriate for heterogeneous groups of young children.

ED 311 **4 cr. 5 hr.**
Behavioral Science in Early Childhood II: Learning and Assessment
This is a continuation of ED 211. (ED 211 and ED 311 cannot be taken simultaneously.)

ED 350 **3 cr. 3 hr.**
Creative Arts in Elementary Education
Students will experience the analogous elements of the arts in a series of workshops. Students will then devise lessons which they will present in class for evaluation and use in a practicum.

ED 360 **3 cr. 3 hr.**
Social Studies in Education
This course equips the future teacher with the knowledge, teaching stratyegies and sequential course development necessary to teach this critical area in the elementary school.
Prerequisite: ED 300

***ED 364** **3 cr. 3 hr.**
Reading in the Content Areas
This course includes investigation of the reading process, discussion of current evaluative methods, analysis of reading strategies, and procedures for development.
Prerequisites: PY 223, ED 301.

ED 370 **3 cr. 3 hr.**
Using Computers in Classrooms
Students will examine the philosophy, theory, and application of the use of computers in classrooms. A significant portion of class time will be devoted to "hands on" experiences with Apple II computers. These experiences will include programming in text and graphics mode, an introduction to the nature and use of LOGO, the use of printers and color plotters, the development of programs designed to enhance the learning abilities of children, and the evaluation of educational software. No prior computer experience is assumed.

ED 400 **3 cr. 3 hr.**
Analysis of Reading Problems
The course will examine the correlates of reading problems, identify principles of diagnosis, and analyze, administer and interpret formal diagnostic tests. Students will demonstrate competency in preparing a case study report.
Prerequisite: ED 210 or ED 303.

ED 405 **4 cr. 5 hr.**
Senior Seminar in Early Childhood
This course covers an examination of the historical perspectives and philosophical orientations in the field of early childhood education. Specific attention is given to an analysis of current issues and programs. Practicum experiences will be required. Required of Early Childhood majors.

ED 410 **3 cr. 3 hr.**
Language Arts in Education
This course provides students with an introduction to the nature of language and language growth. Emphasis is placed on the meaning and importance of language arts as well as focusing on the characteristics of elementary school age children that affect and are affected by the language arts program. Stress is placed on elements of writing, speaking, listening, spelling and handwriting. A field experience is an integral part of the course.
Prerequisite: ED 300.

***ED 478** **3 cr. 3 hr**
Introduction to Learning Disabilities
This course includes a study of some of the causes of school learning disabilities at the Elementary level. Specific techniques and remediation exercises will be discussed.

ED 480 **3 cr. 3 hr.**
Special Methods in Teaching of History
Special techniques for the teaching of history and their relationship to the principles of generai methods.
Prerequisites: ED 301. If HI 485 is not offered when needed, ED 485 meets the same requirement.

ED 485
Special Methods for Teaching in the Modern Secondary School
Methods and philosophical background for teaching in the modern secondary and/or middle schools of today, includes a survey of current school curricula in the various disciplines, planning communication skills, management strategies, providing for special needs, review of relevant literature and/or research, development of teaching skills, techniques of teaching in the specia! subject field of the student, and an overview of school law as it pertains to teachers and students. This course, or the specific course if sufficient numbers, is a prerequisite for student teaching and should be taken the semester prior to student teaching. Students will meet for three hours per week with the instructor and in addition there will be a field experience requirement in keeping with current Massachusetts certification regulations. The field experience component will provide the student with the opportunity to meet with the respective clinical professor for their discipline by arrangement for a minimum of six weeks for at least one hour per week.

ED 486, 487
Student Teaching in History
Student Teaching Practicum in history. Students are assigned to cooperating schools for a semester of student teaching.

ED 490 **3 cr.**
Independent Study in Education
This course provides students in early childhood, elementary, and secondary education with the opportunity to do research with staff guidance in a problem in education. It is limited to juniors and seniors
Prerequisite: permission of Department.

ED 493 **3 cr. 3 hr.**
Topic in Education
Courses having a more narrow focus or those taught on an irregular basis may be offered. New courses may be taught on an experimental basis under this title.

English

Chairman:
Terry Grabar

Professors:
William Barker
Judith Budz
Terry Grabar
Leo Hines
William Keough
Marilyn McCaffrey
Erwin Pally
Lawrence Quigley

Assoc. Professors:
Irene Harris
Louis Shepherd
Robert Welch
Nancy Yee

Asst. Professors:
Colin Bourn
George Case
Eugene Casassa
Joseph Finkel
John McGrail
Irene Miranda
Thomas Murray
Robert Tapply

The Bachelor of Arts in English (Literature) requires English Literature I, II, and III (EN220, 221, 222), Shakespeare (EN402 or 403), American Literature I or II (EN200 or 210), and five literature electives, at least two of them at the 400 level. Second year proficiency in a foreign language is required.

The Bachelor of Arts in English (Professional Writing) requires 36 hours in English including English Literature I, II, and III (EN220, 221, 222), Shakespeare (EN402 or 403), American Literature I or II (EN200 or 210); two 400 level electives; Advanced Expository Writing (EN389), and nine hours from the following courses: Journalism (EN280), Journalism Practicum I and II (EN381, 382), Creative Writing (EN380), Writing for Business and Technology (EN386), American Magazine (EN384), Feature and Magazine Writing (EN387).

Also recommended are 6, 9, or 12 hours of internship. Internship requires Department approval.

The Bachelor of Science in Education, Secondary, in English requires English Literature I, II, and III (EN220, 221, 222),

Shakespeare (EN402 or 403), Literature for Young Adults (EN291), Structure and Nature of Language (EN460), a course in world literature and one in American literature; speech; and Reading in the Secondary School (ED364), Teaching Writing to Secondary Students (EN470), General Psychology (PY110), Adolescent Psychology PY223), Tests and Measurements (PY275), Successful Practices in Secondary School (ED301), The Teaching of English (EN485); and at least 6 hours of electives in English. One semester of the student's senior year must be devoted to student teaching.

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The Minor in English has two tracks, each requiring 18 hours in English courses.

TRACK A, Concentration in Literature, requires: 6 hours from English Literature I, II, and III (EN 220, 221, 222), American Literature I and II (EN 200, 210); 9 hours in literature electives; 3 additional hours in English.

TRACK B, Concentration in Professional Writing requires: 6 hours from English Literature I, II and III (EN 220, 221, 222), American Literature I and II (EN 200, 210); Advanced Expository Writing (EN 389); 6 semester hours in advanced writing courses selected from: Journalism (EN 280), Journalism Practicum I and II (EN 381, 382), Creative Writing (EN 380), American Magazine (EN 384), Writing for the Natural and Social Sciences (EN 385), Writing for Business and Technology (EN 386), and Feature and Magazine Writing (EN 387); 3 additional hours in English.

The minor in Irish Studies requires Twentieth Century Irish Fiction (EN 412), Twentieth Century Irish Drama and Poetry (EN 413), Irish History 1798-1850 (HI 250) and Irish History 1850-present (HI 251), and a 3-credit independent study project in either Irish Literature or History.

*An asterisk indicates that the course is offered infrequently

EN 001
Writing Skills Workshop
This course provides an intensive study of the basic writing skills. It cannot be taken simultaneously with either English Composition I or II (EN 100, 120). It may be taken 3 times for 1 credit per semester.

EN 010 **3 cr. 3 hr.**
Basic College Writing
This course encourages the student through reading and writing exercises to explore the process of writing as well as sentence arrangements and punctuation patterns in Edited American English.

EN 100 **3 cr. 3 hr.**
English Composition I
Students practice expressing ideas with precision, clarity, and economy, and write a research essay. Critical reading is included.

EN 120 **3 cr. 3 hr.**
English Composition II
A continuation of EN 100 but more advanced, the course stresses careful reading, critical thinking, and analytical writing. It requires nine papers on poetry, prose, and drama.
Prerequisite: a passing grade in English Composition I (EN 100).
Prerequisite for all English electives: English Composition I and II (EN 100, 120).

EN 200 **3 cr. 3 hr.**
American Literature I
Representative American writers from Colonial days through the Civil War are studied.

EN 210 **3 cr. 3 hr.**
American Literature II
Students read representative American writers since the Civil War.

EN 220 **3 cr. 3 hr.**
English Literature I
This course examines British writers from the Old English period through the 16th Century.

EN 221 **3 cr. 3 hr.**
English Literature II
This course covers 17th and 18th Century British writers.

EN 222 **3 cr. 3 hr.**
English Literature III
British writers of the Romantic, Victorian, and modern periods will be read and discussed.

EN 230 **3 cr. 3 hr.**
The Handicapped in Literature
The course will examine images of disability as presented in fiction, biography, and autobiography.

EN 240 **3 cr. 3 hr.**
World Literature I
European literary masterpieces from the beginning through the middle of the 17th century are analyzed.

EN 250 **3 cr. 3 hr.**
World Literature II
Students read European literary masterpieces from the mid-17th century to the present.

EN 260 **3 cr. 3 hr.**
The Bible as Literature
This course examines the style, narrative techniques, symbols, and historical setting of the Old and New Testament writers.

EN 262 **3 cr. 3 hr.**
Classical Mythology
Students inquire into pre-Homeric stirrings of symbol and story; Virgil and Ovid and Roman traditions thereafter. The course will end with a study of the great flowering of mythology in the Renaissance.

EN 265 **3 cr. 3 hr.**
Other Voices
Students will read works by significant ethnic writers, first generation immigrants such as James Farrell, Maxine Hong Kingston, Abram Tertz, Neale Hurston. Workshop approach.

EN 270 **3 cr. 3 hr.**
The Short Story
This course includes significant stories of some of the great writers of the Western world, showing the evolution of the short story form.

EN 280 **3 cr. 3 hr.**
Journalism
Students read in the mass media and do individualized writing assignments. There is some emphasis on the technical aspects of newspaper work.

EN 290 **3 cr. 3 hr.**
Childrens Literature
This course studies the content and values of classic children's literature with emphasis on myth and folktales, and attention to the social problems and multiethnic concerns of current literature.

EN 291 **3 cr. 3 hr.**
Literature for Young Adults
Students do wide reading of literature written for the teenager. Different types of literature such as science fiction, fantasy, television plays, realistic novels and poetry will be read and criteria for their selection examined.

EN 295 **1 cr. 1 hr.**
Survey of English Grammar
This course investigates traditional and transformational systems of English grammar as a basis for understanding conventions of English usage.

EN 300 **3 cr. 3 hr.**
World Drama
Significant and representative plays from the beginning to the modern period are studied.

EN 302 **3 cr. 3 hr.**
Modern Drama
Students read the works of such playwrights as Ibsen, Chekhov, Sartre, Brecht, Ionesco, Beckett, and Pinter.

EN 310 **3 cr. 3 hr.**
The World Novel to 1914
Students read significant novels representing various countries and periods as well as stages in the development of this literary form.

EN 311 **3 cr. 3 hr.**
The World Novel Since 1914
Modern novels are studied both aesthetically and as human documents.

EN 325 **3 cr. 3 hr.**
Love and Hate in American Fiction
This course focuses on American writers and the world of emotions in The Scarlet Letter, A Farewell to Arms, the Great Gatsby, Deliverance and others.

EN 330 **3 cr. 3 hr.**
Women and Literature
Literature by and about women is studied.

EN 360 **3 cr. 3 hr.**
The American Pastoral Spirit
This course studies the countryside as a source of literary inspiration from the Horatian concept of rural retirement to the post-industrialism of the late 20th century. Attention will be given to the current literature of the back-to-land movement.

EN 380 **3 cr. 3 hr.**
Creative Writing
Students who have completed English Composition I and II (EN 100, 120), are eligible for this course. Junior standing or approval of the instructor is required.

EN 381 and 382 **3 cr. 3 hr.**
Journalism Practicum: (P1 and P2)
This course is open to members of the Strobe staff, and other students engaged in appropriate on-campus or off-campus journalistic activities. (P1 and P2 may be taken separately for a total of 6 credits).
Prerequisite: Journalism

EN 384 **3 cr. 3 hr.**
The American Magazine
Students do a close study of significant American magazines: their editorial policies and requirements, audience slant, advertisements, visual layouts.

EN 385 **3 cr. 3 hr.**
Writing for the Natural and Social Sciences
This course provides for individualized work in writing appropriate for those taking courses in physical and life sciences, psychology, human services, and other social sciences.

EN 386 **3 cr. 3 hr.**
Writing for Business and Technology
A study of writing for students interested in business, industry, and management. The work includes business correspondence, descriptions of processes and mechanisms, sets of instructions, proposals, abstracts, reports, etc.

EN 387 **3 cr. 3 hr.**
Feature and Magazine Writing
Writing feature articles for newspaper, magazine and trade journals.
Prerequisite: Journalism.

EN 389 **3 cr. 3 hr.**
Advanced Expository Writing
Focused on writing as process, this course is designed to enable student writers to control the broad range of rhetorial principles underlying effective writing in any field. Related grammatical, linguistic, and philosophical questions.

EN 400 **3 cr. 3 hr.**
The Middle Ages
Students examine the many different forms the literature of the British Isles took before Shakespeare.

EN 401 **3 cr. 3 hr.**
Chaucer and his World
This course emphasizes the Canterbury Tales and their medieval background.

EN 402 **3 cr. 3 hr.**
Shakespeare's Drama
This course will focus upon several history plays as well as one comedy and one tragedy. An emphasis will be placed on Shakespeare's interpretation of political life and leadership.

EN 403 **3 cr. 3 hr.**
Shakespeare's Thought
The course will emphasize the conception of human destiny Shakespeare developed in his comedies and tragedies. The plays will be examined for their psychological, philosophical and religious meanings.

EN 404 **3 cr. 3 hr.**
Major English Writers of the 17th Century
Students examine the drama of Jonson, Webster, Middleton, Congreve; the poetry of Milton, Jonson, Donne, Herbert, Herrick, Marvell and Dryden; the prose of Browne and Dryden.

EN 405 **3 cr. 3 hr.**
The Novel in the Eighteenth Century
This course covers the origins of the novel in England and its development as a reflection of the tastes of a rising middle class. Readings include Defoe, Richardson, Fielding, Johnson, Austen and others.

EN 406 **3 cr. 3 hr.**
The Age of Satire: 1700-1750
Emphasis is on the importance to the age of standards in life as well as in literature, the public responsibilities of the writer, and the various ways that humor is used as a weapon for social purposes.

EN 407 **3 cr. 3 hr.**
From Classic to Romantic: 1750-1800
Changing values in philosophy, the nature of man and politics are examined, as well as the reflection of these changes in the art, music, and literature of the late 18th Century.

EN 408 **3 cr. 3 hr.**
Romanticism
Works of writers from Wordsworth through Byron are read.

EN 409 **3 cr. 3 hr.**
The Nineteenth-Century English Novel
This course will cover significant novels demonstrating the changing cultural milieu and varying approaches of the genre during this period.

EN 410 **3 cr. 3 hr.**
Victorian Literature
Man's relationship to a changing society in the face of nineteenth-century industrialization and scientific progress, will be studied in the major writers of the period.

EN 411 **3 cr. 3 hr.**
The Last Victorians
The Wilde 90's, Edwardian exuberance, and World War I are collated with modern trends in poetry, prose, and drama.

EN 412 **3 cr. 3 hr.**
Twentieth Century Irish Fiction
The literature covered runs from James Joyce through Brian Moore, including O'Faolain, O'Connor, O'Flaherty McGahern.

EN 413 **3 cr. 3 hr.**
20th Century Irish Drama and Poetry
Poets, from Yeats through Montague, Kinsella, Heaney; playwrights, from Synge and O'Casey through Beckett and Friel.

EN 414 **3 cr. 3 hr.**
Modern Poetry
Chief modern poets of America and England are covered.

EN 415 **3 cr. 3 hr.**
Mark Twain and American Humor
A consideration of southwestern humor leading up to the writings and career of Mark Twain. Also a study of those humorists who share the Twain legacy.

EN 420 **3 cr. 3 hr.**
The Romance in America
Concepts of nature, idealism and community are studied in the works of Hawthorne, Poe, and others.

EN 421 **3 cr. 3 hr.**
Major American Writers of the Twentieth Century
The varied creativity of American writers of fiction, drama, poetry, criticism, and the essay since World War I is examined.

EN 422 **3 cr. 3 hr.**
American Novel 1890-1950
The reading entails a close examination of several representative works by major American novelists of this period.

EN 423 **3 cr. 3 hr.**
American Novel Since 1950
Seven or eight major novels are closely analyzed.

EN 424 **3 cr. 3 hr.**
Rags to Riches in a Hostile World
The course focuses on a contradiction in the Horatio Alger hero in American Literature. He distrusts the very society in which his success is to take place. This hero has great difficulty finding value and fulfillment in society.

EN 425 **3 cr. 3 hr.**
The Gatsby Myth
The emphasis on money, love and status in the novels of the 20's and 30's: Fitzgerald, Hemingway, Wolfe and Dreiser.

EN 426 **3 cr. 3 hr.**
Journalist to Novelist
The course traces the stylistic and professional development of distinguished American writers who began their careers as reporters. It examines the characteristics that remain constant, the differences that appear in different forms of writing and changes in outlook and aspiration of each writer.

EN 450
Literary Criticism
Critical theory and practice from Aristotle through the 20th Century is studied.

EN 460 **3 cr. 3 hr.**
The Structure and the Nature of Language
Language systems and grammatical theories are studied, along with the history of the English language, theories of language acquisition, and psycho-linguistic and sociolinguistic topics.

EN 470 **3 cr. 3 hr.**
Teaching Writing to Secondary Students
Students do practice and research in alternatives for teaching writing in secondary schools. Different approaches are explored through experiments for the teacher and opportunities to test these approaches in prepracticum experiences.

EN 485 **3 cr. 3 hr.**
The Teaching of English
The methodology of English is examined (lesson planning, selection of materials, curriculum development, review of relevant research).

EN 486, 487 **12 cr.**
Student Teaching in English I & II
Students are assigned to cooperating schools for a semester of student teaching. Students desiring approval for student teaching in English must have taken Literature for Young Adults; a survey course in American Literature; courses in world literature, Shakespeare, language structure, and speech.

EN 490 **3 cr.**
Independent Study
English majors excelling in scholarship may, upon approval of both department head and advising instructor, undertake Independent Study. Course of study, meetings, and credit by arrangement.

EN 492 **3 cr. 3 hr.**
Seminar
This is an opportunity for literary analysis and research, topic to be selected by the instructor. It is primarily for English majors, with others admitted by permission.

EN 493 **3 cr. 3 hr.**
Topics in Literature
This course serves as a vehicle for curriculum experimentation and enrichment. Topics will be selected by the instructor, usually from work in progress.

EN 494, 495, 498 **3, 6, 9 cr.**
Internship

EN 496 **12 cr.**
Internship
The English Department Internship Program offers junior and senior English majors an opportunity to gain valuable on-the-job experience for college credit by spending one semester (full-time or part-time) in business or industry. Students are placed in a field of their choice where they can use their abilities as communicators, learn new skills and sample a potential job market. An internship is a recommended component of the English Department Writing Track. Department approval is required.

Environmental Science

Coordinator:
Howard Thomas

The Bachelor of Science in Biology/ Environmental Science includes all requirements of the Bachelor of Science in Biology. Additional requirements are six semester hours of earth science or geology, a course in computer science, ES 100, ES 480, and three semester hours of electives in Environmental Science. The major recommends that the General Education social sciences requirement be partially fulfilled by courses in geography, macroeconomics, environmental law and urban planning; and that courses in photography, drawing, ethics and technical writing be used to fulfill the humanities requirement in General Education.

Since not all courses are offered in any one year, the student interested in Biology/ Environmental Science is urged to consult closely with his/her advisor to design in advance a suitable selection and sequence of both required and elective courses.

*An asterisk indicates that the course is offered infrequently

ES 100 **1 cr. 1 hr.**
Seminar in Environmental Science
Survey of the practical scope of environmental science with special reference to the variety of activities performed by environmental scientists and the academic preparation and performance expected by potential employees. Relevance of various disciplines to career preparation, Lectures, films, visits to private and governmental agencies, seminars and symposia by

ES 490
Independent Study
Open to students who have permission of the supervising instructor and the department. Course of study, meetings, and credit by arrangement.

ES 493 **3 cr. 3 hr.**
Topics in Environmental Science
Courses having a more narrow focus or those taught on an irregular basis may be offered. New courses may be taught on an experimental basis under this title.

ES 494, 495, 496 **3, 6, 12 cr.**
Internship in Environmental Science
Work experience in private or governmental concerns. Offered: Fall and Spring semesters. Assignments depend on needs of participating organization and the interests and abilities of the student.
Prerequisites: Junior or senior standing and permission of the Environmental Science Committee.

French

Assoc. Professor:
Jeanne Hambright

The Minor in French
The minor in French will require a minimum of 15 semester hours. Students must take Intermediate French I and II or be able to demonstrate proficiency at that level. Elementary French will not count toward the

minor. After demonstrating intermediate level competency, the student may take a combination of courses in French literature, composition, or culture which will yield the requisite 15 hours of credit. For those students starting French above the intermediate level, FR 490 Advanced French Independent Study, may be repeated for credit.

FR 100 **3 cr. 3 hr.**
French for Beginners I
Correct pronunciation, reading ability and fundamentals of grammar and syntax. French gradually becomes the working classroom language. For students with no language experience or less than two years high school level. Students with two or more years not admitted without permission of instructor.

FR 110 **3 cr. 3 hr.**
French for Beginners II
A continuation of FR 100.

FR 200 **3 cr. 3 hr.**
Intermediate French I
Conversation practice; readings stressing life, customs and culture of France.
Prerequisite: two years of high school, French II and/or Instructor's permission.

FR 210 **3 cr. 3 hr.**
Intermediate French II
A continuation of FR 200.

FR 288 **3 cr. 3 hr.**
Methods for Teaching French in the Elementary School
Techniques and materials for use in elementary school. Required for foreign language specialization. Minimum of 12 semester hours of French or its equivalent and Instructor's permission is required.

FR 300 **3 cr. 3 hr.**
French Civilization
The history, geography, fine arts and literature of the French people from the earliest times through today. Extensive readings in French.
Prerequisite: FR 210 or instructor's permission.

FR 330 **3 cr. 3 hr.**
French Literature I

FR 340 **3 cr. 3 hr.**
French Literature II
A continuation of French Literature I including literature of the 19th and 20th centuries.

FR 350 French Conversation and Composition
For students desiring greater fluency in speech and writing. Recommended for civilization and literature courses.
Prerequisite: FR 210 or instructor's permission.'

FR 490 **3 cr. 3 hr.**
Advanced French Independent Study
Prerequisite: Minimum of 12 semester hours, 2.0 grade-average in French, and permission of Instructor, Department Chairman.

FR 493 **3 cr. 3 hr.**
Topics
Courses having a more narrow focus or those taught on an irregular basis may be offered. New courses may be taught on an experimental basis under this title.

Geography

Earth Science Professors:
James Barbato
Robert Champlin
Robert Gardula

The degree of Bachelor of Science and Bachelor of Arts in Geography each require a minimum of 36 semester hours of course work, including GE 100 and the remainder chosen from among courses in the following areas: Earth and or Environment Science, Urban-Community development and/or Public Service, or Area Development. Courses are structured so as to prepare the student for employment or graduate work. The Bachelor of Arts degree requires foreign language proficiency at the second year college level.

The degree of Bachelor of Science in Education, Secondary, in Geography must include GE 100, 488; PY 110, 223, 275; ED 301, EN 470, GE 498 or 499; and 27 semester hours in Geography electives. Students may meet the state certification requirement for teaching Earth Science, as well as Geography, by taking 30 semester hours in related courses which should be chosen after consultation with a member of the geography faculty.

The Minor in Geography The geography minor consists of GE 100, Introductory Geography, and five additional geography courses chosen in conjunction with one of the geography earth science faculty.

GE 100 **3 cr. 3 hr.**
Introduction to Geography
The interrelationships between the physical and cultural elements of man's environment.

GE 110 **3 cr. 3 hr.**
Principles of Human Geography
An introduction to the elements and processes underlying economic, social, and political geographic patterns, with applications to actual case studies and situations.

Physical, Earth, and Environmental Courses

GE 130 **3 cr. 4 hr.**
Earth, Sea and Air
Selected topics from the earth sciences. A laboratory science.

GE 210 **3 cr. 4 hr.**
Geology
An introductory survey of the basic elements of physical and historical geology. Laboratory required. Open to all students. GE 100 strongly suggested.

GE 325 **3 cr. 4 hr.**
Introduction to Historical Geology
This course studies the physical history of the earth based on evidence from the rock and fossil record from the early Paleozoic Era through the present. The evolution of life forms, subjective and absolute dating methods, fossil identification and fossil evidence supporting plate tectonic theory are some of the topics studied. Laboratory required.
Prerequisite: GE 210 or permission of Instructor.

Methods and Techniques

GE 280 **3 cr. 3 hr.**
Map Use and Interpretation
This course considers the nature and role of maps in communicating aspects of the earth's natural and human environments. Involved are: a) Map Reading: relating map symbols to real-world features, b) Map Analysis: extracting information from maps, and c) Map Interpretation: seeking explanations for environmental patterns depicted in a maps system of symbolization.

GE 300 **3 cr. 3 hr.**
Economic Geography
Analysis of factors underlying the spatial distribution of primary, secondary, and tertiary economic activities, with emphasis on locational processes in commercial economics.

***GE 310** **3 cr. 3 hr.**
Political Geography
Dependent and independent political units, boundary disputes, strategic areas, buffer zones and the function of international organizations.

GE 327 **3 cr. 4 hr.**
Common Rocks and Minerals
Major rock and mineral types will be studied. Considerable time will be spent on field and laboratory identification techniques. Mineral crystal systems and rock and mineral forming processes will also be studied.

GE 340 **3 cr. 3 hr.**
Population Geography
Deals with selected demographic processes and population characteristics relative to resources in economically underdeveloped countries and regions. Involves both a systematic and regional view of world population problems.
Prerequisite: GE 210 or CH 110.

GE 480 **3 cr. 4 hr.**
Cartography
Treats the principal aspects of cartography as a communication process. Considers the nature and purpose of mappable information, elements of map design, and methods involved in map construction.

GE 400 **3 cr. 4 hr.**
Atmospheres I-Meteorology
Fundamental principles of weather systems. Emphasis will be on mid-latitude phenomena and weather forecasting. Topics in tropical meteorology and severe storm phenomena will be discussed. Laboratory required.

GE 410 **3 cr. 4 hr.**
Atmospheres II-Climatology
Regional differentiation of the climatic zones of the major land and ocean areas of the world. Special attention will be given to urban climatology and the energy and moisture climatology of the earth.
Prerequisites: GE 400 Meteorology or permission of the Instructor.

GE 411 **3 cr. 3 hr.**
Atmospheres III-Planetary Atmospheres
This course seeks to explain the similarities and differences between the earth's atmosphere and the atmospheres of the planets and moons in our solar system. Each atmosphere will be studied to determine its chemical composition, thermal structure, energy budget, pressure,

wind systems, clouds, precipitation and other pertinent meteorological phenomena.
Prerequisite: GE 400.

GE 420 **3 cr. 4 hr.**
Geomorphology
A comprehensive study of land forms and their origins.
Prerequisites: GE 210 Geology or permission of the Instructor.

GE 430 **3 cr. 4 hr.**
Oceanography
A study of the physical and chemical properties of sea water, atmosphere interaction with the sea surface, currents and volume flow, the energy budget of the oceans, the submarine geology of the ocean basins including a thorough discussion of ocean floor spreading, and coastal processes.

GE 440 **3 cr. 3 hr.**
Urban Geography
Analysis of the external relationships and internal structure of cities, with emphasis on the spatial attributes of contemporary urban qualities and problems in America. Classroom activities are supplemented by applied studies in the greater Fitchburg-Leominster area.

GE 450 **3 cr. 4 hr.**
Remote Sensing of the Environment
Techniques in the use of maps, satellite and aerial imagery as applied to landscape analysis and resource management.
Prerequisite: GE 210.

GE 460 **3 cr. 4 hr.**
Selected Topics in Environmental Geology
Basic principles of geology and geomorphology will be applied to the study of environmental problems caused by such natural phenomena as earthquakes, landslides, flooding, groundwater contamination, pollution, pollution caused by the mining and use of fossil fuels, etc. Data from actual events will be studied and utilized when considering the special problems these natural events cause to man.
Prerequisites: GE 210 or GE 420 or the equivalent.

GE 470 **3 cr. 3 hr.**
Geographic Perspectives on Conservation
An analysis of natural resources problems arising from changes in technology, population pressure, and concern with the quality of environment.
Prerequisite: GE 100.

GE 482 **3cr. 3hr.**
Advanced Cartography
Emphasis on concepts and techniques involved in a variety of mapping problems. Assigned projects will incorporate various methods of data presentation and compilation, as well as map design and symbolization.

GE 485 **3 cr. 3 hr.**
Special Methods in Teaching Geography/Earth Science
Lesson planning, selection of materials, curriculum development, review of relevant research.
Prerequisites: EN 470 and ED 301.

GE 494, 495, 496 **3, 6, 12 cr.**
Internship in Geography
Work experiences in private and governmental concerns. Assignments depend on the needs of the participating agency and interests and vocational objectives of the student.
Prerequisites: Junior or Senior standing and permission of Internship coordinator.

GE 490 Independent Study in Geography
Provides exceptional students the opportunity of research with faculty guidance in a subject or problems of geographic significance.
Prerequisites: 12 hrs. of Geography and permission of Instructor. Hours and credit by arrangement.

GE 493 **3 cr. 3 hr.**
Topics in Geography
Courses having a more narrow focus or those taught on an irregular basis may be offered. New courses may be taught on an experimental basis under this title.

GE 486, 487 **12 cr.**
Student Teaching in Geography
Student Teaching Practicum in geography. Students are assigned to cooperating schools for a semester of student teaching.

GE 488 **12 cr.**
Student Teaching in Earth Science
Student Teaching Practicum in earth science. Students are assigned to cooperating schools for a semester of student teaching.

U.S. and Foreign Area Studies Regional and systematic analysis based upon geographic elements influencing domestic evolution and international relations.
Prerequisite: GE 100.

GE 320 **3 cr. 3 hr.**
U.S. and Canada

German

Professor: John Burke

Assoc. Professor: Jeanne Hambright

The Minor in German The minor in German will require a minimum of 15 semester hours. Students must take Intermediate German I and II or be able to demonstrate proficiency at that level. Elementary German will not count toward the minor. After demonstrating intermediate level competency, the student may take a combination of courses in German literature, composition, or culture which will yield the requisite 15 hours of credit. For those students starting German above the intermediate level, GR 490 Independent Study, may be repeated for credit.

*Asterisk indicates that the course is offered infrequently.

GR 100 **3 cr. 3 hr.**
German for Beginners I
Correct pronunciation, reading ability, and fundamentals of grammar and syntax. German gradually becomes the working classroom. Use of German Language films, cassettes, and utilization of Apfeldeutsch, a computer course for German. Students with two or more years not admitted without permission of the instructor.

GR 110 **3 cr. 3 hr.**
German for Beginners II
A continuation of German 100.

GR 200 **3 cr. 3 hr.**
Intermediate German I
Conversation and laboratory practice; readings stress the life, customs, and culture of Germany.
Prerequisite: Two years of high school German or GR 100 and GR 110.

GR 210 **3 cr. 3 hr.**
Intermediate German II
Continuation of GR 200.

***GR 300** **3 cr. 3 hr.**
German Civilization
The history, geography, fine arts and literature of the German people from earliest times to the present. Extensive readings in German.
Prerequisites: GR 210 or permission of the Instructor.

***GR 330** **3 cr. 3 hr.**
German Literature
Representative works of German literature from the Niebelungenlied to the Tin Drum. Conducted in German.
Prerequisites: GR 210 and/ or Instructor's permission.

***GR 350** **3 cr. 3 hr.**
German Conversation and Composition
This course is designed to increase the student's ability to write and speak German. Students will be expected to write compositions on topics developed orally in class.
Prerequisites: GR 210 or permission of the Instructor.

***GR 360** **3 cr. 3 hr.**
Modern German Literature in Translation
An introduction to the varied creativity of German writers of fiction, drama, and poetry of the 20th century. The German film contribution of the 1920's with feature-length films will be included. Readings will be in translation and the course will be conducted in English.

***GR 370** **3 cr. 3 hr.**
Modern German Culture: "The Road to Hitler"
Given in English. An examination of the cultural factors in music, art, literature and film which illuminate the events leading to National Socialism. Readings will focus on translated materials especially in literature which help to explain why the Germans embraced Adolph Hitler. Includes a significant audio-visual component.

GR 490 **3 cr. 3 hr.**
Independent Study in German
Open to students in the language with the permission of the supervising instructor and the Department Chairman. Meeting times and credit by arrangement.

GR 493 **3cr. 3hr.**
Topics in German
Courses having a more narrow focus or those taught on an irregular basis may be offered. New courses may be taught in an experimental basis under this title.

Graphics

Departments of Computer Science, Communications Media, Industrial Technology

Graphics is an interdisciplinary subject area with applications in Computer Science, Communications/Media and Industrial Technology. The Interdisciplinary Graphics Minor develops an appreciation for all three areas while concentrating in one of the areas. Students gain a theoretical background in Computer Science, a design/applications background in Communications/Media and a production background in Industrial Technology.

Required Courses:

CS 150 Introduction to Pascal
CM 381 Graphic Design I
IT 150 Graphic Arts Processes or
CM 391 Graphic Arts Production
CS/CM/IT Interdisciplinary Graphics Seminar

A concentration (2 courses) in one of the following areas: Note: Students must select a concentration in a department outside their major field of study.

Concentration in Computer Science:

CS 155 Data Structures CS
Computer Graphics for Non-majors (Pascal)

Concentration in Communications/Media:

CM 389 Electronic Graphic Design
CM 382 Graphic Design II

Concentration in Industrial Technology

IT 241 Automated Drafting Systems
IT 250 Offset Lithography or
IT 353 Typography I

History

Professors:
Lawrence Arnold
George Merriam
Pasquale Micciche
John Moon
Donald Norton
Edmund Thomas

Asst. Professors:
Norman Carson
John Clark
Douglas Hebb

The Bachelor of Science and Bachelor of Arts in History must include HI 110, 112, 210, 220, 400; one course from HI 180, 190, 407, 408, 260, 460, 481 or 482; one elective from European History; one elective from U.S. History; and an additional 6 semester hours of History electives. The Bachelor of Arts requires foreign language proficiency at the second year college level.

All B.A. and B.S. candidates must have a concentration in a subject area outside of history. This concentration will be constructed with the approval of the student's departmental advisor. Fifteen semester hours are required for a concentration. Recognized minors in other disciplines may be substituted for the concentration. A Bachelor of Arts in History with a concentration in European Studies must include HI110, 112, 210, 220, 400 and 12 semester hours of History electives of which at least 9 semester hours are in European History and 15 semester hours of related courses of which at least 3 semester hours each in the areas of Geography, Art, Philosophy and Literature. The latter courses must be chosen from the list of courses applicable to the European Studies concentration. This degree must also include proficiency in a modern European language at the third year college level.

A Bachelor of Science in Education, Secondary, in History must include PY110, 223 and 275; or ED485; HI110, 112, 210, 220, 400; one course from HI180, 190, 407, 408, 460, 260, 481, and 482; one elective from European History; one elective from U.S. History; and an additional 9 semester hours of History or courses related to History. The latter includes government, political, science, economics, history or literature. The major must also include ED301, ED489, HI 486, 487, and EN 470. 36 hours in history are required for Commonwealth of Massachusetts certification; with at least one course in a non-Western area (e.g., Russia, Far East, Latin America).

The Minor in History ***18 cr.***

A student may complete a minor in history by taking 18 semester hours of history. Emphasis in the minor may be either on European History or American History (including Latin American History).

Minor in History with European Emphasis:

1. HI 112 Modern European History II

2. Either HI 210 or 220

3. Four additional courses in European History. (HI 490, Independent Study in History, may be used to fulfill 3 semester hours of this requirement provided the topic is one in European History.)

Minor in History with American Emphasis:

1. HI 220 United States History II

2. Either HI 110, 112 or 130

3. Four additional courses in United States or Latin American History. (HI 490, Independent Study in History, may be used to fulfill 3 semester hours of this requirement provided the topic is one in United States or Latin American History.)

The Minor in Irish Studies ***15 cr.***

HI 250 Irish History 1798-1850 HI 251 Irish History 1850-present EN 412 Twentieth Century Irish Fiction EN 413 Twentieth Century Irish Drama and Poetry

The remaining 3 semester hours must be completed by taking a 3 semester hour Independent study project in either Irish History or Literature.

Asterisk indicates that course is offered infrequently.

HI 110 **3 cr. 3 hr.**
Modern European History I
The evolution of modern European ideas and institutions from the Renaissance to the Napoleonic era. Political events, selected biographies, topics in cultural history, and economic and social changes.

HI 112 **3 cr. 3 hr.**
Modern European History II
Political developments, ideologies such as socialism and nationalism, the impact of science and technology, and the changing relationship of Europe to Africa and Asia.

HI 130 **3 cr. 3 hr.**
Medieval Europe
Major characteristics and institutions of medieval civilization. Within a chronological framework of political events, attention is given to topics in art, literature, philosophy, and religion.

HI 140, 150 **3 cr. 3 hr.**
British History **each semester**
The first semester covers the development of English government and culture from the earliest times to the reign of Queen Elizabeth I. The second semester covers from 1603 to the present with emphasis on parliamentary government, the industrial and agricultural revolutions, the evolution of the British Empire and Commonwealth, and the position of Britain today.

HI 180 **3 cr. 3 hr.**
History of Mexico, Central America and the Caribbean
Both HI 180 and 190 survey pre-Columbian and colonial backgrounds, the clash and fusion of cultures, and the evolution of today's Latin American civilizations as they relate to specific geographical areas.

HI 190 **3 cr. 3 hr.**
History of South America
See HI 180.

HI 210, 220 **3 cr. 3 hr.**
United States **each semester**
History I and II
A survey of the United States History beginning with colonial times and continuing through the era of Reconstruction following the Civil War the first semester. The second semester covers from Reconstruction to the present.

HI 230 **3 cr. 3 hr.**
American Women, 1870-1970
Women in America, the struggle against discrimination and for the ballot, the history of various women's groups, including working class, black, and immigrant women. Not merely the study of exceptional women but women as housewives, breadwinners, and citizens.

HI 250 **3 cr. 3 hr.**
Irish History, 1798-1850
The Rebellion of 1798 and the Act of Union; O'Connell and Catholic emancipation; the rise of Irish nationalism, the great famine of 1845-50.

HI 251 **3 cr. 3 hr.**
Irish History, 1850 to the Present
The Home Rule movement; Parnell and the land league; the Celtic revival; the rebellion of 1916 and the civil war; the Republic of Ireland and Ulster in the twentieth century.

HI 300 **3 cr. 3 hr.**
American Colonial History
Exploration, settlement patterns, imperial system, social structure, rise of representative government in America, and the 18th-century wars for empires.

HI 311 **3 cr. 3 hr.**
The American Revolution
The coming of the Revolution, war tactics and strategy, problems of the Confederation period and the American Constitution.

HI 312 **3 cr. 3 hr.**
The Age of Revolutions
Major political, social, and cultural developments in France, England, and the United States during the age of the American, French, and Industrial Revolutions, 1763-1848. The meaning and applicability of the term "revolution" will be examined, and there will be a series of case studies of topics such as art and politics, romanticism, and the religious revival in England. Extensive use is made

HI 313 **3 cr. 3 hr.**
Twentieth-Century Europe
From the first World War to the present. Cultural, scientific, and social developments as well as domestic and international politics.
Prerequisite: HI 112 or permission of Instructor.

HI 315 **3 cr. 3 hr.**
Massachusetts History
The Bay State from Plymouth Rock to the Kennedy clan. Political, social & economic trends.

HI 320 **3 cr. 3 hr.**
The American Civil War and Reconstruction 1850-1865
Politics, slavery, and Lincoln's rise to power; political, military and diplomatic aspects of the war; failure of reconstruction.

HI 330 **3 cr. 3 hr.**
Progressive and New Deal America
Topics in American politics, economics, and Society from 1900-1945, with special emphasis on reform movements, the great Depression, and World War II.

HI 340 **3 cr. 3 hr.**
Topics in Cold War America
Recent American History from 1945 to the present. Topics include the Cold War, the Arms Race, Joseph McCarthy, the 1960's, the Vietnam War, Watergate, Society, the economy, and post-war presidents. Emphasis on post-war foreign policy as it has affected the United States.

HI 350 **3 cr. 3 hr.**
History of the Money Machine in the West, 1400-Present
A study in some depth of the evolution of money and banking in the Modern West with particular attention to the American experience. The concern is with the social and/or private purpose of these tools of exchange.
Prerequisite: Modern European History I and II, U.S. History I and II.

HI 351 **3 cr. 3 hr.**
American Labor, 1840-1960
A study of the patterns, personalities and social tensions involved in the responses of American Labor to the changing economic construction: from the pre-industrial society through the industrial to the post-industrial.
Prerequisite: U.S. History I and II.

HI 360 **3 cr. 3 hr.**
United States Industrial History I
The industrialization and urbanization of the United States from colonial times to 1870.

HI 371 **3 cr. 3 hr.**
United States Industrial History II A continuation of HI 360 from

HI 400 **3 cr. 3 hr.**
Historiography
An introduction to the historical method with stress on bibliographical aids, historical fallacies, and the theories of history as they have developed. Primarily for history majors.

HI 407 **3 cr. 3 hr.**
Imperial Russia
Founding of the Kievan State; the Mongol, Muscovite, and Imperial Periods to the Revolution of 1917

HI 408 **3 cr. 3 hr.**
The Soviet Union
The Bolshevik seizure of power; institutional development of the Soviet state and CPSU: Soviet American relations.

HI 410 **3 cr. 3 hr.**
The Frontier in American History
The Frontier studied as a historical, social, economic, and psychological process to determine its impact on American development.

HI 420 **3 cr. 3 hr.**
The Republican Era, 1877, 1877-1912
Major movements of the late nineteenth and early twentieth centuries in United States History including Grangerism, Populism, urbanization, trade unionism, socialism, and progressivism.

HI 430 **3 cr. 3 hr.**
U.S. Foreign Relations: The First Hundred Years
Diplomacy of the Revolution, foreign relations of the new nation, the Monroe Doctrine and problems of boundaries and expansion, the Civil War and after to about 1890

HI 431 **3 cr. 3 hr.**
The American Military Experience I
A survey of military history from the Ancient Greeks to the 1870's. The emphasis is on the changing military strategy, tactics and weapons during their long time span, and the role of the infantry, calvary and artillery as they developed to implement the above.

HI 432 **3 cr. 3 hr.**
The American Military Experience II
A survey of United States history from the Spanish-American War to the present. Integrates various elements of national security policy (military, political, diplomatic, economic, etc.) to provide an understanding of the problems of national security from a broad perspective.

HI 450 **3 cr. 3 hr.**
Tudor England 1485-1603
Political, social and religious developments from Henry VII to Elizabeth I. The Reformation, the rise of Puritanism, foreign affairs, constitutional developments.

HI 451 **3 cr. 3 hr.**
Stuart England 1603-1689
Political, social, religious and constitutional developments from James I to William and Mary. Opposition to the early Stuarts, the civil war, the restoration and revolutionary settlements. Events of Irish and Scottish as well as English history.

HI 460 **3 cr. 3 hr.**
Contemporary Latin America
Latin America since World War II. A study of economic, cultural and political trends, agrarian reform and economic development.

HI 480 **3 cr. 3 hr.**
Black America
An investigation of the historical development of the black man in the United States from his West African origins to the present. Emphasis will be placed on the role the black played in the economic, political and social life of the United States.
Prerequisite: HI 210 or 220 or permission of Instructor.

Open to students majoring or specializing in history with the permission of the supervising instructor and the department. Meeting times and credit by arrangement.

HI 481, 482 **3 cr. 3 hr.**
Far East I and II
The emphasis of this course will be on the development of Chinese, Japanese, Korean, and South East Civilization from the earliest time until the middle 19th century period. Political, military and economic background will be covered, but special emphasis will be placed on cultural history. Far East II will be a continuation.

HI 485 **3 cr. 3 hr.**
Special Methods in Teaching of History
Special techniques for the teaching of history and their relationship to the principles of general methods.
Prerequisite: ED 301. If HI 485 in not offered when needed, ED 485 meets the same requirement.

HI 486, 487
Student Teaching in History
Student Teaching Practicum in history. Students are assigned to cooperating schools for a semester of student teaching.

HI 490
Independent Study in History

HI 493 **3 cr. 3 hr.**
Topics in History
Courses having a more narrow focus or those taught on an irregular basis may be offered. New courses may be taught on an experimental basis under this title.

The Honors Program

The Honors Program provides an enriched, stimulating set of courses for the best prepared and most qualified entering students as well as for top ranking Fitchburg students. Its objectives are:

To provide an integrated set of General Education courses at the freshman level which provides a rigorous and stimulating program to entering honors students. These courses are selected from courses commonly taken in many different major programs. The English composition courses are modified in accordance with the plan of integration.

To offer more advanced courses to currently enrolled students in order to provide them with a high level of proficiency in research and writing skills.

To provide students with exposure (through the 1 s.h. Honors Seminar) to a wide variety of faculty research projects and areas of faculty expertise and interest.

To provide a set of extracurricular experiences which are culturally enriching and support the course work of the program.

The Honors Program includes four segments, each corresponding to one year in a student's academic schedule:

The Freshman Year

The freshman program is entitled **Modern Man: An Historical Perspective** and includes an integrated program. During the first semester, students study the 19th Century — movements, concepts, and trends. The specific studies include English, music and history. During the spring, students study the 20th Century in English, contemporary art, and history. Other courses may be substituted for these, but in all cases, they will follow the proposed 19th and 20th Century themes.

Students in all degree Programs are required to take freshman English. Thus, the students in the Honors Program enroll in English Composition I and II. Honors students are able to utilize the program's history courses in partial fulfillment of their social science requirement, while the honors art and music courses may be used in partial fulfillment of the humanities requirement.

The Sophomore Year

The title of the sophomore portion of the Honors program is **Methods of Inquiry.** One course is offered each semester and is selected from courses such as Comparative Economic Systems, Political Systems, Ethics, the Philosophy of Man, and Comparative Religions. Each offering at the sophomore level demonstrates the methods of inquiry which are utilized in the particular discipline being studied.

The second part of the sophomore program includes the **Honors Seminar** lectures which are organized around a central theme and involve many different topics representing the areas of expertise of the college faculty.

The Junior Year

The program for the junior year is both interdisciplinary and thematic. The title for the program at this level is **Contemporary Dilemmas: Ethical, Scientific, Political and Philosophic.** The theme of this course and the faculty teaching it will change from year to year. One theme that has been offered was Science and Society, which focused on the scientist in literature and ethical problems posed by modern biology, and was taught by a Biologist and English faculty member. Another was Psychobiolgy — a study of the Brain, taught by a biologist and psychologist.

Senior Year

The senior year of the Honors Program is devoted to the research for and writing of an **Independent Honors Thesis.** The topic of this senior Honors Project is selected from those covered in previous honors courses or from the student's major discipline. The student is assigned three credits for each semester's work. Topics for all senior projects must be approved by the student's individual committee and submitted to the Honors Committee which is composed of several members of the faculty and the Undergraduate Dean.

Freshman students are invited to join the Honors Program based on their high school grades and preparation, SAT scores, and references from secondary teachers. Sophomore and junior students are invited to join if they have a cumulative average of 3.4 or better. (See "The Honors Program" under

"Courses and Programs in the College" or the Undergraduate Dean, Room 231, Condike Science Building, for more information.)

Human Services

Coordinator:
Richard J. Spencer

Professors:
Donald M. Isaac
David C. Maloney

Assoc. Professor:
Richard J. Spencer
Cynthia Tower

Asst. Professor:
Mary King

The Human Service major at Fitchburg State College is interdisciplinary, administered by the Department of Behavioral Sciences in cooperation with the departments/areas of Business Administration, Environmental Science, History, Philosophy, Special Education, Economics, Biology, Physical Education, Education, Modern Languages, English, Computer Sciences, Speech, and Political Science, etc. This interdisciplinary approach allows students to develop the broad background necessary for working with people. The student will obtain a B.S. in Human Services preparing him/her for work in a variety of settings in the helping professions at entry level positions and for graduate study.

Aims and Objectives

The Human Services Program is competency based, with the College providing the theoretical and conceptual bases as well as facilitating the development of generic helping skills. Students will further develop and demonstrate their knowledge and skills within a community setting.

Students will get the training they need so that they will be prepared for careers in the helping professions and will be able to compete successfully in the job market. The community is served through trained personnel who will meet the demands for increased social services in our society.

Among the special characteristics of Fitchburg State's program, in addition to the interdisciplinary approach, is the coordination of supervised work experiences with academic studies. This experience involves working in organizations under professional supervision in conjunction with human service course work taken at Fitchburg State College. This gives students experience which strengthens their position when pursuing a career. Further, it gives them a more realistic basis for choosing a career, and it gives potential employers an opportunity to screen students based on job performance. Students are also encouraged, throughout their stay at Fitchburg State College, to gain additional experiences through volunteer activities.

Concentrations in Human Services

The Human Services program at Fitchburg State College offers Concentrations in seven areas: Human Services Generalist; Administration; Family and Children's Services; Gerontology; Juvenile Justice, Mental Health/Rehabilitation; and Social Work. Students should meet with their Human Services advisors to learn about the recommended course work and the career possibilities related to each concentration.

Admission and Retention Policy

A student may enter the Human Services Major by either declaring it as a major upon admission to the college or as internal transfer (transferring into the Human Services major from another major within this college). A student who has declared Human Services as a major upon admission (as a freshman or as an external transfer) will be subject to retention review by the Human Services Curriculum Committee following the completion of Introduction to Human Services. Retention will be based upon both academic performance and suitability for the field (as determined by the Human Services curriculum committee). Entrance into the major as an internal transfer necessitates a 2.5 cumulative grade point average, successful completion of the course: Introduction to Human Services, and a determination of suitability for a career in the Human Services field.

Program Structure

There are three components to the major: A. The Human Service Core (these courses are required for all majors)

HS 110
Introduction to Human Services
HS 365
Interviewing Techniques
HS 352
Social Group Work
HS 366
Methods of Case Recording and Analysis
HS 487, 488, or 489
Field Work

There are two Field Work options: (1) a Block Placement, for 12 credits, involving 36 hours weekly for one semester (fall or spring); or (2) 18 hours weekly for two semesters (6 credits each) beginning in the fall and continuing until the end of the spring semester. Since some agencies only accept one or the other option for placements, it is essential for a student to plan well in advance in order to know if placement will begin in the fall or spring, as well as to complete all prerequisites to Field Work at least one semester prior to placement.

Admission into the Human Service Program does not guarantee entry into Field Work. Eligibility for Field Work will be based upon the successful completion of the following requirements:

1. Attendance at the registration meeting and other designated workshops (semester before Field Work).

2. A current professional liability insurance policy.

3. Successful completion of the courses: Social Group Work and Methods of Case Reporting and Analysis.

4. Approval of the "Application Package" by the Human Services Curriculum Committee, viz., application form, eligibility determination, transcript, and waiver letters (if applicable). The eligibility criteria are:

A cumulative G. P. A. of 2.50 in required Human Services/Behavioral Science courses;

demonstrated effectiveness in writing and oral communication skills;

no incomplete grades in any course, no probationary status, and no unresolved failures in the candidate's major field of study;

a semester between the course, Methods of Case Reporting and Analysis and field work; a minimum of 180 hours of agency/organization practica experience; and twelve semester hours of course credit, with three difference faculty members, in the Human Services Program (transfer students)

5. Successful preplacement interview with the Field Work/Internship Coordinator and with the supervisor at the placement site.

6. A completed Acceptance Agreement, agreed upon and signed by the Field Work/Internship Coordinator, the supervisor of the Placement site, and the student.

7. A completed Field Work contract which is agreed upon and signed by the college's Supervising Professor, the supervisor at the placement site, and the student (negotiated during the first two weeks of field placement).

B. Human Services Behavioral Sciences Area
Students must take PY 220, Human Growth and Development and PY 335, Abnormal Psychology plus nine more credits in Psychology, Sociology and/or Human Services. Six of the nine credits must be in Human Services.

These courses must be relevant to career goals and must be approved by a student's Human Services advisor and notation to that effect must be placed in the student's folder.

C. Related Courses
Students must take nine credits in courses in departments other than Behavioral Sciences. These courses must be relevant to career goals and Field Work plans. This requirement may be fulfilled by taking courses in one or more departments, e.g. Business Administration, Computer Sciences, Special Education, Political Science, Economics, English, Biology, Philosophy, Physical Education, Speech, etc. These courses must be approved by a student's Human Services advisor. Notation to that effect must be placed in the student's folder.

Physical Education Specializations in Human Services Students in Human Services may specialize the Dance, Recreation, or Dance/Recreation by selecting four three-credit professional preparation courses and four one-credit physical activity courses under the guidance of the Physical Education Department. Notation to that effect will be placed in the student's folder.

Voluntary Experiences It is to the student's advantage to gain experiences in agencies beyond those required in courses. Students may become familiar with area agencies through the Human Services Fair, held every fall semester. Wherever students work, they should obtain letters of recommendation for their placement folders. This will aid students in course work at Fitchburg State College and also when applying for employment or graduate school.

Policy Regarding Liability Insurance: Liability Insurance will be required of all Human Services Majors and all other students taking a Human Services course which involves a practicum experience.

Policy Concerning Human Service Major and Advisor Meetings: There is a departmental policy concerning meetings called for majors and meetings with a student's academic advisor. The policy is that failure to attend departmental meetings called for Behavioral Science majors and/or failure to contact advisors may be grounds for a student's name to be dropped from the roster of those listed in the major.

*An asterisk indicates that the course is offered infrequently

HS 110 **3 cr. 3 hr.**
Introduction to Human Services
An introduction to the general field of Human Services. Course goals include an introduction to the scope and nature of Human Services work, and the agencies, organizations, and intervention models utilized. Particular focus is on the underlying philosophies, issues, and dynamics in agency/organization function. Guest lecturers from agencies, student presentations, agency reports, and a required practicum experience (45 hours per semester) represent priority activities in the course. This course is a prerequisite to all Human Services courses.

HS 115 **3 cr. 3 hr.**
Community Resources
This course will acquaint students with the services of a variety of public (federal, state, and local) and private voluntary nonprofit agencies which provide services for various populations (topics to vary by semester). Students will learn what services are provided, how to obtain services, how to make referral to these agencies and how the agencies are operated (including staffing, funding and administrative aspects of the agencies). This course may emphasize special types of agencies in different semesters.
Prerequisite: HS 110.

HS 220 **3 cr. 3 hr.**
Delivery of Human Service Systems
This course will deal with social agencies/organizations: how they establish goals, priorities and programs; how they are governed, staffed and financed; and how each relate to the needs of the people in the area served. Content may differ according to the delivery system being addressed. A supervised practicum (20 hours per semester) is required.
Prerequisite: HS 110.

HS 230 **3 cr. 3 hr.**
Introduction to Rehabilitation Counseling
An overview of the vocational rehabilitation process in the U.S., including its history and governing federal legislation. Emphasis on the medical, psychological, sociocultural, and vocational factors in rehabilitation of handicapped individuals. This course will focus on the role of the Rehabilitation Counselor as a professional in the rehabilitation process.
Prerequisite: HS 110.

HS 240 **3 cr. 3 hr.**
Crisis Intervention
This course focuses on the concepts and techniques of Crisis Intervention. Many individuals are faced with such crisis situations as job loss, unwanted pregnancy, divorce, operations, death and dying. Specialized short-term techniques have been developed to help people in these situations. Students will also be required to spend approximately 4 additional hours per week in a crisis center for supervised experiences. The crisis center may ask students for a commitment beyond one semester.
Prerequisites: HS 110, PY 335.

HS 242 **3 cr. 3 hr.**
Juvenile Justice
A course designed to develop student awareness of past and contemporary philosophies, practices, and paradoxes of juvenile justice. The course will examine the programmatic efforts designed for juveniles "in trouble with the law" and will focus on the relationships between the components of this system of justice. The content of the course will be supplemented by current journal research, lectures, and panel discussions by practicing professionals, and a field-based class. A supervised practicum (20 hours per semester) is encouraged.
Prerequisite: HS 110.

HS 350 **3 cr. 3 hr.**
Social Work: Theory and Practice
Social Work is one of the central professions in the Human Services. This course will deal with the history, concepts, basic issues and

techniques of social work including casework, group work and community organization activities. Advanced study and career opportunities will also be explored.
Prerequisites: HS 110, SO 110.

HS 351 **3 cr. 3 hr.**
Social Casework
This course will explore casework concepts and techniques as utilized in a variety of settings, e.g. family agencies, mental health settings, hospitals, courts. The focus will be on the casework process with individuals, couples and families.
Prerequisites: HS 110, HS 350

HS 353 **3 cr. 3 hr.**
Community Organization
This course will focus on methods used in organizing citizen action groups to bring about change. Principles, methods and techniques of organizing, goal formulation, group maintenance, community planning and strategies will be studied.
Prerequisites: HS 110

HS 354 **3 cr. 3 hr.**
The Abuse and Neglect of Children
This course will present an overview of concepts vital to understanding and working with the abusive and neglectful parent: including differentiation between abuse and neglect, reporting responsibilities, legal aspects, prognosis, prediction and the role of the community. Case studies will be used to enhance student understanding.
Prerequisites: HS 110, and PY 220.

HS 355 **3 cr. 3 hr.**
Services to Children
Students examine the variety of services available to children to support, supplement, and substitute for the family. Students will learn to understand the structure of the services provided, and to explore the ethical dilemmas which such services may create.
Prerequisite: HS 110.

HS 358 **3 cr. 3 hr.**
Social Welfare Policy
This course enables students to learn the importance of social welfare policy, the relationship of values to policy formulation, and how to analyze policy. Students apply this knowledge to income maintenance, poverty, health and mental-care, housing and neighborhood living space, and to the general problems of service delivery.
Prerequisite: HS 110

HS 360 **3 cr. 3 hr.**
Human Services Administration
The study of Human Services Administration is an exploration of administrative functions and their relationship to organizational effectiveness and efficiency. The internal and external politics of agency survival are addressed, and the theoretical concepts of management and leadership styles are explored. Course content is supplemented by lectures and panel discussions by practicing professionals, field-based classes, and current journal research.

A supervised practicum (20 hours per semester) is encouraged.
Prerequisite: HS 110.

HS 365 **3 cr. 3 hr.**
Interviewing Techniques
Skill in interviewing is essential to the development of professional competence in the helping professions. This course is designed to help the student learn about the problems and processes of interviewing while developing basic skills needed to become an effective interviewer. The course will include assigned readings, class discussions, taped interviews, demonstrations, and practice sessions in class.
Prerequisites: HS 110, PY 335 and permission of Instructor. Students must preregister in the semester prior to the course.

HS 366 **4 cr. 8 hr.**
Methods of Case Reporting and Analysis
This course exposes students to the technical and practical skills involved in the process of preparing, recording, presenting, and analyzing individual case reports. Case report applications, as they relate to schools, clinics, social service agencies, the courts, and other human service agencies will be integrated during the course. A supervised practicum in an approved agency setting (90 hrs per semester) is required. During the practicum, students will engage in interviewing and observing clients plus reviewing clients' records (confidentiality is respected). Students become familiar with the agency's case reporting format/style; data/information gathering methods; philosophy; case storage, sesurity and transmittal procedures; confidentiality; case conference procedures, etc.
Prerequisites: HS 365 and permission of Instructor. Students must preregister in the semester prior to the course.

HS 374 **3 cr. 3 hr.**
Probation
This course focuses on the correctional philosophy of probation by developing an understanding of its historical and legal evolution, its essence, and its administration in varied court systems. The responsibilities of probation professionals are explored in conjunction with criminal justice issues and practices which affect the court's decision to use this alterative to incarceration. Course content is supplemented by current journal research, lectures by practicing professionals, and a field-based class. A supervised practicum (20 hours per semester) is encouraged.
Prerequisite: HS 110.

HS 487-488, 489 **6 cr. 18 hr.**
12 cr. 36 hr.
Field Work in Human Services
Field Work is the structured academic experience which allows Senior Human Services majors who have successfully met eligibility criteria to integrate and apply the skills and theory of the Human Services discipline in a field-based setting. Such an experience helps the student develop an understanding of the effects of administrative practices and governing policies on the ability to carry out the responsibilities of his/her field placement.

Students participate under the supervision of qualified professionals in Human Service Organizations, e.g., mental health agencies, social services, hospitals, prisons, family service agencies, probation departments, residential programs, nursing homes, community advocacy organizations, programs for the aging, crisis centers, etc. Also, some placements are conducted in industrial settings, e.g., community relations, employee assistance programs, personnel departments, corporate donations and human resource development programs.

Placements may be in direct-service or in administrative settings. In addition to the field experience, students participate in a weekly seminar held by the college' supervising professor. Here, students share their experiences and develop heightened awareness of their roles in the organizations in which they are functioning.

HS 487-488: students will work in an agency 18 hours per week throughout the school year, beginning in September. 6 credits each semester. HS 489: a block placement of 36 hours per week for one semester, either Fall or Spring. 12 credits, one semester.

Students must have completed their prerequisites at least 1 semester before taking Field Work and must pre-register with the Field Work/Internship office in the beginning of the semester prior to the semester before they plan to enter an agency, i.e, students planning a Fall placement must have completed their prerequisites by the end of the previous Fall semester and pre-register with the instructor early in the previous Spring. Students must have had previous volunteer experience prior to enrolling in Field Work.
Prerequisites: HS 352, HS 366, and successful completion of the Field Work eligibility requirements.

HS 490
Independent Study
Independent Study is offered to outstanding students of Junior or Senior standing and requires approval of the professor, of the Human Services Curriculum Committee, and of the Chairman of the Behavioral Sciences department. Independent Study may take the form of special advanced reading programs or problem identification and research. Under no circumstances will independent study be substituted for regularly scheduled courses.

HS 493 **3 cr. 3 hr**
Topics in Human Services
Courses having a more narrow focus or those taught on an irregular basis may be offered. New courses may also be taught on an experimental basis under this title.

Industrial Technology

Chairman:
Philip Tardanico

Professors:
George B. James
Lawrence Ovian

Assoc. Professors:
Howard Besnia
Stanley Bucholc
Erling Hanson
Lloyd Harte
Robert Kokernak
Edward Martens
Philip Tardanico
Jack Wescott

Asst. Professors:
James Andrews
Joseph Farias
Edson Phelps
Luther Tabor
Steven Therrien

The Industrial Technology department is unique at Fitchburg State College in that it offers two degree programs in five concentrations: the degree of Bachelor of Science in Education, Industrial Arts (124 semester hours), and the degree of Bachelor of Science in Industrial Science (120 semester hours), concentrations in Construction Technology, Electronics Engineering Technology, Graphic Arts Technology, or Manufacturing Technology.

Industrial Arts Major

The Industrial Arts program prepares students for a teaching career. Successful completion of this program enables the graduate to meet the certification requirements of the Commonwealth of Massachusetts. Upon certification, the graduate is eligible to teach in the public schools (grades 5-12) in the following technical areas:

Drafting
Electricity/Electronics
Graphic Arts
*Manufacturing-Construction
Power Mechanics

*to include the areas of wood and metal Fabrication.

The Program requires a first and second level course in each of the technical areas previously mentioned. Added to these required courses are two technical electives selected by the student in conjunction with a departmental advisor. Further coursework is also required to develop teaching skills, followed by a one semester student teaching experience. To enroll in student teaching, the candidate must have a 2.5 cumulative average for all Industrial Technology courses and have successfully completed a first-aid course, General Psychology (PY 110), Adolescent Psychology (PY 223), and received a positive recommendation from the faculty of the Industrial Techology department.

Industrial Science Major

In our complex industrial society, there exists an ever increasing need for trained personnel to meet the challenges of new and emerging technologies. The concentrations offered in the Industrial Science program were developed with the intention of providing a pool of highly skilled technologists which will sustain the needs of industry within the Commonwealth as we approach the 21st century. The concentrations include Construction Technology, Electronics Engineering Technology, Graphic Arts Technology, and Manufacturing Technology.

18 semester hours of required core courses must be taken. Selections are made from the following:

Evolution of Industrial Technology
Technical Analysis II
Technical Drawing
Electronics I
Metal Fabrication
Graphic Arts Processes
Automotive Technology
Wood Fabrication

Each concentration requires a unique combination of these course offerings.

The *Construction Technolgy* concentration provides students with information essential for managerial personnel in the construction industry. Students are exposed to a planned sequence of courses preparing them for on-site construction related activities. These include the coordination of workers, materials, subcontractors, and local, state, and federal regulatory agencies.

The following courses (21 semester hours) are among those required to assist the student in developing the skills necessary to function as a member of a construction management team:

Architectural Drawing
Structures
Environmental Energy Systems
Estimating & Bidding
Construction Supervision
Seminar in Construction
Strength of Materials

An additional 21 semester hours of Free and Technical electives are required to complete the program.

The *Electronics Engineering Technology* concentration prepares students for positions in the challenging field of electronics By developing the theoretical and practical skills required for this discipline. Electronics and electronic systems play a key role in modern industrial societies serving as a source of power, as a means of affecting control, as a means of communication, and as a means of processing information.

The skills students need are acquired through a planned sequence of courses (21 semester hours) involving classroom work in conjunction with hands-on experience with the most modern testing and measuring equipment. Some of the required courses are:

Electronics I
Electronics II
Automated Manufacturing & Robotics
Engineering Experimentation
Statics
Digital Electronics
Control Theory

An additional 21 semester hours of Free and Technical electives are required to complete the course.

In addition to these courses, students select Electronics electives with the help of a departmental advisor to further enhance their technical competence. Courses from the Math/Science curriculum are also required to broaden the technical background.

The *Graphic Arts Technology* concentration provides students with technical experience in printing. Publishing is a growth industry. The needs for qualified Graphic Arts technical people has greatly increased as the overall makeup of the final product has changed. Today's printed products required higher quality, more color, and people with the appropriate technical expertise to coordinate these effects in a modern printing plant. As our society advances, the needs to transmit printed information increases at an ever higher rate.

The following technical courses (21 semester hours) are among those required to develop within the student the skills necessary to function in the Graphics Industry:

Offset Lithography
Production Printing
Screen Printing
Computers in Industrial Technology
Estimating & Production Control
Seminar in Graphic Arts
Layout & Copy Preparation

An additional 21 semester hours of Free and Technical electives are required to complete the program.

Manufacturing Technology is designed to develop both technical and analytical competencies required of entry-level positions within manufacturing engineering support. Many employees have stated the need for resourceful, technically competent people to interface between engineering and other personnel within the manufacturing environment.

The competencies are acquired through a sequence of courses involving laboratory experiments and additional coursework within the Math/Science curriculum. This combination provides the student with the practical knowledge of manufacturing processes, the ability to apply these processes, and the ability to plan, coordinate, and implement aspects of production projects.

Among the required courses (21 semester hours) designed to develop these skills are the following:

Strength of Materials
Statics
Automated Drafting Systems
Automated Manufacturing & Robotics
Engineering & Experimentation
Design & Planning
Production Planning & Control

An additional 21 semester hours of Free and Technical electives are required to complete the program.

Senior status students in all concentrations are eligible to participate in the Internship program, allowing a student with an appropriate grade average to receive up to 12 academic credits for a one semester work experience.

The Minor in Industrial Science

The minor in industrial science offers a concentration in manufacturing, construction, electronics/ engineering, graphics or industrial training.

Manufacturing Technology
IT 272 Robotics I
IT 373 Automated Manufacturing & Robotics II
IT 241 Automated Drafting Systems
IT 131 Materials
Two approved electives

Construction Technology
IT 240 Architectural Drawing
IT 231 Structures
IT 330 Estimating and Bidding
IT 332 Construction Supervision
Two approved electives

Electronics Engineering Technology
IT 110 Electronics I*
IT 210 Electronics II*
IT 310 Electronics III*
Three approved electives

*Students with equivalent course may substitute technical elective.

Graphics Technology
IT 150 Graphics Arts Processes or
CM 391 Graphics Arts Production
IT 250 Offset Lithography
IT 352 Printing, Estimating and Production Coordination
IT 252 Layout and Copy Preparation or
CM 381 Graphics I
Two approved electives

Industrial Training
IT 380 Methods of Teaching Industrial Arts
IT 381 Curriculum Development in Industrial Arts
CM 235 Communications Technology
Three approved electives

Prerequisites: Application and departmental approval; prerequisites may be waived based upon an individual's experience and background.

Interdisciplinary Graphics Minor, See Graphics.

*Asterisk indicates that the course is offered infrequently.

IT 110 **3 cr. 4 hr.**
Electronics I
This beginning course will provide an overview of electronics technology by introducing students to selected topics in linear circuits, analog electronic circuits, and digital electronic circuits.

IT 120 **3 cr. 4 hr.**
Metal Fabrication Systems, Procedures and Techniques
Study of mass-production theory, systems, and procedures in metal working.

130 **3 cr. 4 hr**
Wood Fabrication Systems, Procedures and Techniques
Furniture is designed, constructed and finished. Advanced fabrication concepts and techniques are studied.

IT 131 **3 cr. 4 hr.**
Materials
An overview of selected materials and their properties including laboratory experiences designed to give students an understanding of research with materials.

IT 140 **3 cr. 4 hr.**
Technical Drawing
This course will include lettering, dimensioning, orthographic projection, symbols, sectioning, isometric, and auxiliary views. Problem development and blueprint reading will be stressed.

IT 150 **3 cr. 4 hr.**
Graphic Arts Processes
Production and evaluation of messages utilizing graphic arts processes. This includes phototypesetting, camera work, stripping, plate making and offset press operations.

IT 160 **3 cr. 4 hr**
Automotive Technology
An introduction to multi cylinder gasoline engines; systems include ignition, fuel, brake, drive line and valve train.

IT 170 **3 cr. 3 hr.**
Evolution of Industrial Technology
Study of the history of industrial technology, and the qualifications, duties, and responsibilites of related careers. A field based prepracticum experience is an integral part of this course. This experience may be in a school or industrial setting.

IT 171 **3 cr. 3 hr.**
Technical Analysis
Development of computational skills used in solving problems involving polynomials, equations, trigonometry and vectors in the technical areas of mechanics, electronics, and fluid dynamics.
Prerequisite: M 130

IT 210 **3 cr. 4 hr.**
Electronics II
This course will begin to develop the concepts and techniques appropriate to design and analysis of linear and analog electronic circuits. Electronic circuits employing discrete devices will be introduced.
Prerequisite: IT 110

IT 220 **3 cr. 4 hr.**
Advanced Metal Fabrication Systems
Specialized processes in the metal working industry will be studied. Laboratory experiences will include performing operatings with tool cutter grinders, indexing heads, numberial control millers, turret lathes, and tracer lathes.
Prerequisite: IT 120

IT 230 **3 cr. 4 hr.**
Production Furniture Fabrication
Emphasis on the production of a piece of furniture employing the developing and use of jigs, fixtures and other suitable mass production procedures. Appropriate methods of production managment are employed.
Prequisites: IT 130,IT 140

IT 231 **3 cr. 4 hr.**
Structures
A study of the construction industry with emphasis on residential construction methods, practices and procedures. A study of tools, equipment, and techniques used to construct a free standing structure as well as research in architectural problems related to residential construction.
Prerequisites: IT 130, IT 140

IT 240 **3 cr. 4 hr.**
Arthitectural Drawing
Students design a practical residential structure, conforming to standard practices and Building codes. Technical skills are developed enabling students to communicate ideas. Topics include materials of construction, history and development of various styles, orientation of house on lot, loads, and design of structural members. Field trips and available films are used.
Prerequisite: IT 140

IT 241 **3 cr. 4 hr.**
Automated Drafting Systems
This course is designed to teach the general concepts related to automated drafting with a special emphasis on technical drawing. Specialized applications of industrial practices for drafting will be experienced in this course. One semester of technical or mechanical drafting is a prerequisite. A computer background is not necessary.
Prerequisites: IT 140, or permission of the instructor.

IT 250 **3 cr. 4 hr.**
Offset Lithography
The students study the lithographic form of printing as it is used in modern industry. The majority of the course is spent in the darkroom and setting up and running offset presses. Concepts include line copy, halftone, special effects, diffusion transfer and density. Roles students will pursue are designer, photographer, flat-stripper, platemaker, press operator and binder.
Prerequisite: IT 150

***IT 251** **3 cr. 4 hr.**
Production Printing
Emphasis on scheduling and production of contracted jobs. The course is designed to allow serious students to apply their previous instruction in a controlled, industrial type setting. Enrollment is limited to ten students.
Prerequisites: IT 150 and permission of Instructor.

IT 252 **3 cr. 4 hr.**
Layout and Copy Preparation
Design and production of messages will be studied. Students will prepared artwork and mechanicals using equipment found in the Industrial Technology Department. The technology of communications will also be included.
Prerequisite: IT 150

IT 260 **3 cr. 4 hr.**
Alternate Energy Sources
The study of solar and other forms of energy to supply household needs. Students build and test both commercial and laboratory made devices.
Prerequisites: IT 160 or permission of Instructor.

IT 270 **3 cr. 3 hr.**
Man Technology Society
Study of universal characteristics of technology, including effects of technology on society and culture. Topics of interest are researched.

IT 271 **3 cr. 3 hr.**
Statics
Study of laws of static equilibrium of real bodies. Includes beam and structural analysis, friction, centroids, and moments of inertia.
Prerequisite: IT 171

IT 272 **3 cr. 4 hr.**
Computers in Industrial Technology
This course will familiarize students with computers through presentation of selected hardware and software concepts. Opportunites for extensive programming practice will be provided.

IT 273 **3 cr. 4 hr.**
Robotics I
This course will provide an opportunity to learn the fundamentals of industrial robotics. Basic theory and practice will be stressed. Topics that will be studied and experienced will include AS and DC motors, industrial robot programming, terminology and robot classifications.

IT 274 **3 cr. 4 hr**
Safety and First Aid
Introduction to the latest occupational safety and health standards and to provide opportunity for the student to perform practical inspections, complete reports, and recommend corrective measures to insure safety and healthful comditions. Basic First Aid instruction is included.

***IT 275** **3 cr. 4 hr.**
Plastics Technology
An investigation of the rapidly expanding area of plastics, how they are produced, their merits and limitations. Tests are conducted to confirm reference data and to promote a better understanding of various plastics and products made from them.
Prerequisite: Some background in Chemistry essential.

IT 276 **3 cr. 4 hr.**
Ceramics
Course includes throwing on the wheel and glazing techniques, with strong emphasis on different sculptural forms. (Credit will not be given for both AR 214 and IT 214.)

IT 277 **3 cr. 4 hr.**
Introduction to Experimentation I
Emphasis is on the accumulation and evaluation of experimental data. Topics include literature surveys, project organization and managements, types and uses of instrumentation, instrument accuracy, statistical analysis of data, design of experiments, and reportwriting techniques.
Prerequisites: IT 171 and four of the appropriate freshman level courses.

IT 278 **3 cr. 4 hr.**
Materials Technology
Topics include atomic bonding, atomic arrangements, structural imperfections, electronic structures and processes, phases and reaction rates and stability of materials in service environments.
Prerequisites: IT 171, PH 270, CH 100 taken concurrently or permission of the Instructor.

IT 279 **3 cr. 4 hr.**
Crayonstone Lithography
Students grind and prepare their stones, develop and transfer their illustrations to the stones, draw and shade on the stones and print their illustrations. (Credit will not be given for both AR 425 and IT 279.)

IT 290 **3 cr. 4 hr.**
Designing and Planning
Elements of product design are experienced through problem solving. Drafting, human engineering and product analysis and incorporated in design and construction of prototypes.
Prerequisite: IT 171 and four of the appropriate freshman level courses.

IT 310 **3 cr. 4 hr.**
Electronics III
This course will further develop the concepts and techniques appropriate to the design and anlysis of linear and analog electronic circuits. It will provide sufficient background for students who wish to elect upper level electronics courses.
Prerequisite: IT 110, IT 210

IT 311 **3 cr. 4 hr.**
Digital Electronics
An introduction to the techniques of analyzing and synthesizing digital processors. Emphasis in design work is on IC technology.

IT 312 **3 cr. 4 hr.**
Control Theory
Introduction to control theory utilizing examples of mechanical, fluidic, electronic and hybrid control systems. Emphasis is on design utilizing the project approach.
Prerequisites: IT 256, IT 356.

IT 320 **3 cr. 4 hr.**
Numerical Control
Introduction and laboratory experiences are designed to provide students with the basic knowledge and techniques of programming and operations of the tape-controlled milling machine.
Prerequisite: IT 120

IT 321 **3 cr. 4 hr.**
Machine Processes
The design and fabrication of metal products utilizing machine tools, metalworking processes and welding.
Prerequisites: IT 220

IT 322 **3 cr. 4 hr.**
Product Modeling and Rendering
A laboratory course focusing on the preparation of product renderings and the development of three dimensional models for presentation and analysis of design products, processes or systems. The course will cover the types and

uses of renderings and models; techniques and standards in their development; and appropriate material representation.
Prerequisites: IT 130, 270, 120, 150, 290.

IT 330 **3 cr. 4 hr.**
Estimating and Bidding
The principles of preparing comprehensive unit pricing and sytems approach for construction will be taught in this course. The emphasis will be on detailed estimates in order to determine the scope and cost of each proposed design element.
Prerequisites: IT 231, 240, 331

IT 331 **3 cr. 4 hr.**
Environmental Energy Systems I
A survey course concerning itself with the principles of heating, ventilating, air-conditioning, purification and control systems, as well as electrical and electronic control and delivery systems, water feed and delivery system, waste water disposal systems.
Prerequisites: IT 160, 140, 110.

IT 332 **3 cr. 4 hr.**
Construction Supervision
This course will enhance the students understanding and skills for the function of supervision of a construction project. The emphasis will be on coordinating all of the construction resources including materials and manpower needed for the successful completion of on-site structure.
Prerequisites: IT 231, 240, 352, 331.

IT 333 **3 cr. 4 hr.**
Wood Technology
A course in which students investigate defects which occur in wood and how these affect the grading of lumber. The process of drying lumber, and its effects on the material are stressed. The processing of various wood products is included.

IT 340 **3 cr. 4 hr.**
Engineering Drawing
This course includes orthographic projection, intersections, developments, revolutions, axonometrics, assembly details, and pictorial drawings.
Prerequisite: IT 140.

IT 350 **3 cr. 4 hr.**
Screen Printing
Students work with both hand-cut stencils and photo-direct emulsions. Emphasis is on multiple color registration and halftoning, using both hand and machine printing techniques.
Prerequisite: IT 150 or permission of Instructor.

IT 352 **3 cr. 4 hr.**
Printing Estimating and Production Coordination
This course provides students with an opportunity to properly determine how to estimate printed products. Relationships between the estimating department, sales, customer service, order writing and production departments will be covered.
Prerequisite: IT 250

***IT 353** **3 cr. 4 hr.**
Typography I: Dynamics and Disciplines
Origins of the alphabet, evolution of type; traditional typography; nomenclature; classification of typefaces: planning, layout, the budget considerations; dimensional coordination, proportion and the grid system, copyfitting, markup, and proofreading; composition and computer technology. Organized for a reciprocity of subject matter in a technological environment.
Prerequisites: IT 150, 250.

***IT 354** **3 cr. 4 hr.**
Calligraphy
A brief historic introduction to the arts of the Merovingian and Carolingian Miniscules that preceded the modern hand lettering of today. The art of the broad nib pen and wide brush will be emphasized. Students develop a series of plaques, signs and charts.

IT 360 **3 cr. 4 hr.**
Advanced Alternate Energy Sources
Course is limited to students who have demonstrated the ability and desire to continue the research and development of a solar energy system that showed promise in IT 260.
Prerequisites: IT 260 or permission of Instructor.

IT 370 **3 cr. 4 hr.**
Pneumatic and Hydraulic Energy Systems (Fluid Dynamics)
Flow phenomena of compressible and incompressible fluids are studied, including fluid statics and dynamics, boundary layers, conduit fluid flow, dynamic drag and lift.
Prerequisite: Technical Mathematics course.

IT 371 **3 cr. 4 hr.**
Product Analysis and Evaluation
A course designed to test and evaluate the ability of a product to provide its intended service or function. Destructive and nondestructive tests are employed.
Prerequisite: It 131.

IT 373 **3 cr. 4 hr.**
Automated Manufacturing
To develop competencies in the set-up, control and use of CNC equipment; and to develop integration applications between robots (for material handling and assembly) and CNC automated manufacture equipment.
Prerequisites: IT 140, 120, 130.

IT 380 **3 cr. 3 hr.**
Methods of Teaching Industrial Arts
This course is designed to provide the prospective industrial arts teacher with a series of related academic, observational adn participating experiences based on the fundamental elements of the teachinglearning process. Students will develop, implement and evaluate a variety of thortrange instructional methods.

IT 381 **3 cr. 4 hr.**
Curriculum Development in Industrial Arts
During this course the student will be presented experiences which relate directly to the development of a course of study. Students will also have the opportunity to analyze and develop strategies pertaining to curriculum development. Students also experience a pre-practicum in a public school industrial arts program.

IT 382 **3 cr. 3 hr.**
Evaluation and Lab Management
During this course the student will be presented learning experiences relating to management tasks and ancillary activities. Students will also receive information regarding student evaluation.

IT 390 **3 cr. 3 hr.**
Production Planning and Control
Theory and practive in the essentials necessary for the operation of a manufacturing or service facility and the main thrust of this course. Layout of production, line operations, analysis of time requirements and related work resulting in an economical and efficient operation are included.

IT 391 **3 cr. 4 hr.**
Engineering Experimentation II
Activities required of technicians in industry are simulated. Students construct and assemble laboratory apparatus and perform tests on that apparatus.
Prerequisites: IT 171, 277 and four of the appropriate freshman level courses.

IT 393 **3 cr. 4 hr.**
Strength of Materials
An introduction to the behavior of real materials under the influence of forces and couples. Axial, shear, torsional and flexural stresses and strains are determined.
Prerequisites: IT 171, IT 271.

***IT 410** **3 cr. 4 hr.**
Industrial Electronics
Study of applications of electronic principles in devices and equipment involving thermo$DHelectronics, photo-electrics, electromagnetics, solid-state, welding and motor control, etc.
Prerequisite: permission of Instructor.

IT 411 **3 cr. 4 hr.**
Electronic Communications Systems
The system and circuits utilized in electronic communications will be studied including both transmitters and receivers. Methods of modulation will be discussed. Television will be utilized as a representative system.
Prerequisite: permission of instructor.

***IT 420** **3 cr. 4 hr.**
Heat Treatment of Metals
This course covers the study of ferrous and non-ferrous metals commonly subjected to heat treatment to modify their physical properties. Hardening, tempering, annealing, and surface treatments are studied.

***IT 421** **3 cr. 4 hr.**
Welding and Casting
Instruction and laboratory experiences are designed to provide students with the basic knowledge and techniques of welding, cutting, and braizing using oxyactylene welding equipment. Instruction and laboratory experiences are designed to provide students with the basic knowledge and techniques of AC and DC welding and inert gas welding. Students acquire basic knowledge and application of casting techniques used in the non-ferrous casting industry. Field trips to casting industries are included in the course.

***IT 422** **3 cr. 3 hr.**
Design of Machine Elements
Introduction to design principles and failure modes for various mechanical components. Includes static and fluctuating Loads for brittle and ductile materials, fatigue stree concentrations.
Prerequisites: IT 340, 393.

***IT 423** **3 cr. 4 hr.**
Physical Metallurgy
A study of metals, their properties and how they can be modified. Equilibrium and phase diagrams are introduced as needed. A variety of laboratory experiences are provided.
Prerequisite: permission of Instructor.

***IT 430** **3 cr. 4 hr.**
Jig and Fixture Design and Construction
Introduction in the principles of jig and fixture design are covered. The students construct simple jigs and fixtures for various applications.
Prerequisites: Four of the appropriate freshman level courses. (See IT 313, IT 314, IT 333, and IT 315 in the materials area for possible electives related to transformation.)

IT 431 **3 cr. 4 hr.**
Seminar in Construction
This course is open to student specializing in construction. The course will deal with current trends and issues facing the construction industry at local, state, and federal levels. Emphasis on utilizing available resources to solve current problems.
Prerequisites: IT 231, 330, 332, 240.

***IT 440** **3 cr. 4 hr.**
Descriptive Geometry
Descriptive geometry is concerned with graphical representation and the solution of problems using spacial relationship of points, lines, and planes bymeans of projections.
Prerequisite: IT 340.

***IT 441** **3 cr. 4 hr.**
Drawing Graphics
A course designed to provide students with depth in drafting field and provide areas not normally covered in a Drafting Program. The student should have a good understanding of the drafting field prior to taking this course. The areas to be covered are (a) Boat Lofting (b) Topographic Drawing (c) Graphs and Charts.
Prerequisite: IT 140.

***IT 442** **3 cr. 4 hr.**
Advanced Design
Experimental design projects using the two and three dimensional approaches. The design of communication forms will make use of the five senses.
Prerequisites: IT 250.

***IT 450** **3 cr. 4 hr.**
Process Color Separation
Students experience the direct screening process obtaining four separation negatives with masks. The negatives are printed by means of a color key.
Prerequisite: IT 250.

***IT 451** **3 cr. 4 hr.**
Illustration
An intensive, advanced course in allusive and expressive tyupography oriented towards students who aspire to a career in graphic and typographic design, type design, or art direction. Organized for reciprocity of subject matter in all illustrative context, the instruments and methods of the new technologies are studied, and the interdependence of design and reprodution are addressed through practical application.
Prerequisites: IT 150, 250.

IT 452 **3 cr. 4 hr.**
Seminar in Graphic Arts
Students will study and discuss current trends, issues, problems and technical material. Emphasis will be placed on comprehending why the trends must take place and how the emerging technology will allow this to happen. Students will be able to project future technical trends within the graphic arts area. Prerequistie: IT 352

***IT 460** **3 cr. 4 hr.**
Internal-Combustion and Diesel Engines
The students test, modify, and retest an engine. Diesel theory, injectors, and pumps are included.
Prerequisites: IT 160 or permission of instructor.

IT 470 **3 cr. 4 hr**
Research Industrial Materials
The students are required to select a material and conduct an In-depth study. Class reports are required. Individual initiative and efficient use of time are stressed.
Prerequisite: permission of Instructor.

***IT 471** **3 cr. 4 hr.**
Thermal Technology
The laws of thermal energy and heat transfer are studied, including specific heats, thermal conductivities, gas and steam cycles, conduction, convection and radiation.
Prerequisite: IT 171.

IT 472 **3 cr. 3 hr.**
Manufacturing
Theory as well as practical work is emphasized in this course. Lab work includes the use of a variety of inspection and measuring tools pertinent to quality control in a manufacturing operation. Procedures used to determine product assurance, reliability and testing are studied.

IT 473 **3 cr. 4 hr.**
Problems of Mechanical Maintenance
A course designed to investigate problems encountered in the maintenance of mechanical equipment. Topics covered are lubrication, bearing installation, replacement of parts, safety, and color dynamics.

***IT 480** **3 cr. 4 hr.**
Industrial Arts for Special Education
Fundamentals of planning and constructing teaching aids of projects are stressed. Knowledge of tools, machines, and processes is covered.

IT 484 **3 cr. 3 hr.**
Pre-practicum and Seminar
Opportunity to formulate concepts of industrial arts education and develop a working knowledge of principles and practices of industrial arts administration. Pre-practicum experiences are also included. State requirement for certification.

IT 486 **10 cr. 30 hr.**
Practicum in Industrial Arts
Experience in planning and implementing instructional strategies in a public-school setting. Requirements include selfevaluation. State requirement for certification.

IT 496 **12 cr. 36 hr.**
Internship in Industrial Science
Students participate in an industrial experience with the approval of the Industrial Technology faculty.

IT 490 **3 cr.**
Independent Study
Students may enroll in a Directed Study

IT 493 **3 cr. 3 hr.**
Topics in Industrial Arts
Courses having a more narrow focus or those taught in an irregular basis may be offered. New courses may be taught on an experimental basis under this title.

Mathematics

Chairman:
Barry Light

Professor:
Barry Light

Assoc. Professors:
Richard Bisk
Christine Cosgrove
Lucy Dechene
Ernest Fandreyer
Gerald Higdon

Asst. Professors:
Robert Bentley
Robert Clark
Nicholas Copoulos
Donald Freeburg
Claire McAndrew
Abdulkeni Zekeria

The Bachelor of Science and the Bachelor of Arts in Mathematics must include Calculus I, II, III, and IV, Linear Algebra, Abstract Algebra and at least fifteen additional semester hours of advanced mathematics (300 or 400 level), at least nine of which must be at the 400 level. One course in Computer Science is required at the level of CS 150 or higher. Graduate courses may be substituted for 400 level courses. The Bachelor of Arts degree requires foreign language proficiency at the second year level.

The Bachelor of Science in Education, Secondary, in Mathematics must include Functions, Calculus I, II, III, and IV, Linear Algebra, Geometry, Probability and Statistics I, Abstract Algebra and at least six additional semester hours of advanced mathematics courses at 300 or 400 level. Graduate courses may be substituted for 400 level mathematics courses. One course in Computer Science is required at the level of CS 150 or higher.

Successful Practices in Secondary Education, Teaching Writing to Secondary Students, General Psychology, Adolescent Psychology, Tests and Measurements, Methods and Materials in Secondary Mathematics and Student Teaching in Mathematics are also required for the Bachelor of Science in Education.

A minor in mathematics contains 21 semester hours of which 12 semester hours are taken in Calculus I, II, and III and either Abstract or Linear Algebra. The additional three elective courses may be chosen from Introduction to Mathematical Thought or any mathematics course at the 300 or 400 level. At least one of the three electives must be at the 400 level.

*Asterisk indicates that the course is offered infrequently.

MA 010
Basic Mathematics I
A review of basic arithmetic skills and an introduction to elementary algebra.

MA 020
Basic Mathematics II
A continuation of Basic Mathematics I. Concepts studied are from Elementary Algebra through quadratic equations.

MA 100 **3 cr. 3 hr.**
The Nature of Mathematics
An elementary course intended to acquaint the student with the nature of mathematical activity such as inductive and deductive reasoning, and problem solving. This course is not a review of high school mathematics.
Prerequisite: MA 020 or Permission of the Department.

MA 110 **3 cr. 3 hr.**
The Nature of Statistics
Elementary concepts of probability and statistics with applications are studied to provide an awareness of the scope and uses of statistics in the world. (Credit will not be awarded for both MA 110 and MA 170.)
Prerequisite: MA 020 or Permission of the Department.

MA 115 **3 cr. 3 hr.**
Technical Mathematics
A study of elementary topics used in solving technical and industrial problems. This course is intended for students in the Industrial Technology Department.
Prerequisite: MA 020 or Permission of the Department.

MA 120 **3 cr. 3 hr.**
Finite Mathematics
A variety of discrete mathematical models are developed and applied to business and to the social and life sciences. Topics include matrices, linear programming, probability and game theory.
Prerequisite: MA 020 or Permission of the Department.

MA 130 **3 cr. 3 hr.**
Functions
This course prepares students for the study of calculus. Topics include the real numbers, equations and inequalities, analytic geometry, and polynominal, trigonometric, exponential, and logarithmic functions.
Prerequisite: MA 020 or Permission of the Department.

MA 150 **3 cr. 3 hr.**
Introduction to Mathematical Thought
Intended to introduce mathematics as the science of reasoning. Topics include elementary set theory, logic, techniques of proof, basic properties of the real number system, mathematical induction, and axiomatic systems.
Prerequisite: MA 130 or its equivalent.

MA 170 **3 cr. 3 hr.**
Applied Statistics I
Methods of data collection, organization and interpretation, sampling, probability, estimation, and testing are applied to areas including biology, business, medicine, economics, and education. (Credit will not be awarded for both MA 110 and MA 170.)
Prerequisite: MA 020 or Permission of the Department.

***MA 200** **3 cr. 3 hr.**
Informal Geometry
An intuitive study of basic geometric objects and concepts. Topics studied vary but are chosen for their intuitive appeal as well as their geometric significance.
Prerequisite: MA 020 or Permission of the Department.

MA 220 **3 cr. 3 hr.**
Calculus for Business
A survey of methods and applications of the calculus for functions of one variable that are useful in business and economics. Topics include differentiation with applications to rates and maximum and minimum values, integration techniques with applications to areas, cost, and rates.
Prerequisite: MA 130.

MA 230 **3 cr. 3 hr.**
Calculus I
The derivative of a function, methods of differentiation and applications are studied.
Prerequisite: MA 130 or its equivalent.

MA 240 **3 cr. 3 hr.**
Calculus II
The Riemann Integral, methods of integration, and applications are studied.
Prerequisite: MA 230 or its equivalent.

MA 260 Linear Algebra
Topics include vector spaces, linear transformations and matrices with applications.
Prerequisite: MA 230

MA **3 cr. 3 hr.**
Mathematical Modeling
Deterministic and probabilistic models from the physical, social and life sciences will be studied. The course will emphasize the uses of mathematics, rather than the acquisition of new mathematical knowledge. New mathematical ideas are introduced only when they aid in the study of a particular application.
Prerequisites: MA 240, 260

MA 270 **3 cr. 3 hr.**
Applied Statistics II
A continuation of MA 170. Topics include estimation and testing, simple linear and multiple regression, analysis of variance, and nonparametric methods.
Prerequisite: MA 170

MA 280 **3 cr. 3 hr.**
Business Statistics
Topics include descriptive methods, probability distributions, estimation, testing, analysis of variance, and regression analysis.
Prerequisite: MA 220

MA 283 **3 cr. 3 hr.**
Methods and Materials in Elementary Mathematics (Math Concepts)
Topics from arithmetic, algebra, and geometry of the modern elementary school mathematics programs are studied. Attention is given to the structural and discovery approach.
Prerequisite: MA 020 or Permission of the Department.

MA 300 **3 cr. 3 hr.**
Geometry I
A formal study of basic concepts in geometry and the foundations of Euclidean geometry. This course is for mathematics majors or minors and students with a mathematics specialization; all others need permission from the instructor.

MA **3 cr. 3 hr.**
Numerical Analysis
Numerical analysis is concerned with devising algorithms for approximating, in an efficient manner, the solutions to mathematically expressed problems. Topics will be chosen from: round-off error and computer arithmetic, solutions of algebraic and transcendental equations, interpolation and polynomial approximation, numerical differentiation and integration, solutions of ordinary differential equations, solutions of linear systems and approximation theory. Both mathematical rigor and computer solutions will be stressed.
Prerequisites: MA 260, 330, program ability in a numerical program language (e.g. Fortran, Pascal).

MA 310 **3 cr. 3 hr.**
Discrete Algebraic Structures
A study of discrete algebraic structures of interest in computer science. Topics include partial orders, Boolean algebra, graph theory and finite state machines.
Prerequisite: MA 260.

MA 315 **3 cr. 3 hr.**
Elementary Number Theory
Properties of the integers are studied. Topics include divisibility, prime numbers, congruences, Diophantine equations and mathematical induction.
Prerequisite: MA 150

MA 320 **3 cr. 3 hr.**
History of Mathematics
The development of mathematical ideas and methods from ancient to modern times and their relevance to other fields of knowledge will be studied. This course is intended for mathematics majors, mathematics minors or mathematics specialists.

MA 325 **3 cr. 3 hr.**
Probability and Statistics I
A careful development of elementary probability theory with applications is followed by the study of discrete and continuous random variables including the binomial, Poisson, and normal.
Prerequisite: MA 240.

MA 330 **3 cr. 3 hr.**
Calculus III
Conic sections, indeterminate forms, Taylor polynomials, infinite and power series, differentials and multiple integrals are studied.
Prerequisite: MA 240

MA 340 **3 cr. 3 hr.**
Calculus IV
The calculus of polar coordinates, parametric curves, vector-valued functions, quadratic surfaces and directional derivatives are studied. Double integrals in polar coordinates, line integrals and differential equations may also be considered.
Prerequisite: MA 330.

MA 355 **3 cr. 3 hr.**
Ordinary Differential Equations
Linear first and second order differential equations, methods of solution and applications are studied. Series solutions and higher order linear equations are considered.
Prerequisite: MA 260 and 330.

MA 360 **3 cr. 3 hr.**
Introduction to Mathematical Logic
An elementary introduction to classical and symbolic logic, including standard sentential and first order predicate calculi.
Prerequisite: MA 150 or MA 230.

***MA 405** **3 cr. 3 hr.**
Topology
Topics include point sets, metric spaces, topological spaces, connectedness and compactness.

MA 485 **3 cr. 3 hr.**
Methods and Materials in Secondary Mathematics
Curriculum and pedagogy of secondary school mathematics are studied. The course includes a practicum of preprofessional experiences.
Prerequisite: MA 240 and 260.

MA 415 **3 cr. 3 hr.**
Advanced Multivariate Calculus
The differential and integral calculus of vector-valued functions and functions of several variables.
Prerequisite: MA 340

MA 420 **3 cr. 3 hr.**
Real Variable Theory
Rigorous treatment of the foundations of differential and integral calculus with such topics as the real numbers, continuity, metric and Euclidean spaces.
Prerequisite: MA 260 and MA 330

MA 425 **3 cr. 3 hr.**
Probability and Statistics II
Random variables and their probability distributions are used to study problems in estimation, hypothesis testing, regression, and analysis of variance.
Prerequisite: MA 325.

MA 430 **3 cr. 3 hr.**
Abstract Algebra I
A study of algebraic structures including groups, rings, and fields.
Prerequisite: MA 150 or consent of Instructor.

MA 440 **3 cr. 3 hr.**
Operations Research
Topics include linear programming, duality, networks, transportation problems, dynamic programming and stochastic models.
Prerequisites: MA 260 and MA 330.

MA 486 **6 cr. 6 hr.**
Student Teaching In Mathematics
Student Teaching Practicum in Mathematics. Students are assigned to cooperating schools for one-half semester of student teaching.

MA 487 **6 cr.**
Student Teach II Math

MA 490 Independent Study
Prerequisite: Permission of department.

MA 493 **3 cr. 3 hr.**
Topics in Mathematics
Courses having a more narrow focus or those taught on an irregular basis may be offered. New courses may be taught on an experimental basis under this title
Prerequisite: Permission of the Department.

Medical Technology

Coordinator, Professor: Rose Marie Neunherz
Assistant Professor: Benjamin Andrusaitis, Dorothy Boisvert

The medical technology program, leading to a B.S. in Medical Technology, offers students a challenging and interesting mix of both academic and applied courses. Students develop skills in the basic sciences that serve as the foundation upon which their clinical courses are built. During the first three years, students are introduced to the profession of laboratory science and the clinical courses necessary to practice in the profession. Skills are developed in well equipped, modern laboratories similar to those found in both hospital and industrial settings. During senior year, students take advanced courses in clinical science.

Liability insurance is required of all students enrolled in field-based or clinical courses, courses with practicum experiences, or courses otherwise deemed by the respective academic programs.

In order to remain in the program, students must maintain an overall cumulative average of 2.5 in the sciences as well as in each of the clinical courses.

Upon completion of the program, students find themselves well prepared to obtain positions in hospital, research, industrial, zoological, and private laboratories as well as to become sales and technical representatives for a variety of industrial corporations.

All students in the M.T. program are required to take the following courses:

Biology
BI 242 Human Physiology
BI 280 Genetics
BI 410 Biochemistry
BI 440 Microbiology
BI 481 Immunology

Chemistry
CH 110, 120 General Chemistry I, II
CH 200, 210 Organic Chemistry I, II
CH 350 Instrumental Analysis

Math
MA 170 Applied Statistics

Physics
PH 115 Physics for Life Sciences, 120

Medical Technology
MT 100 Introduction to Medical Technology
MT 120 Medical Terminology
MT 140 Clinical Laboratory Techniques
MT 200 Basic Hematology
MT 300 Professional Issues
MT 320 Immunoassay
MT 340 Parasitology/Mycology/Virology
MT 360 Clinical Laboratory Data
MT 400 Clinical Hematology
MT 420 Clinical Chemistry
MT 440 Clinical Microbiology
MT 460 Immunohematology
MT 480, 485 Clinical Correlations I, II

MT 100 **1 cr. 2 hr.**
Introduction to Medical Technology
An integrated lecture-laboratory course designed to acquaint the student with the role of the medical technologist in the clinical laboratory, the duties of technologists, employment opportunities and educational requirements for the profession. Laboratory work includes introduction to techniques in hematology, clinical chemistry, immunohematology and clinical microbiology. 2 hrs. lecture lab per week plus additional hours for independent project.

MT 120 **1 cr. 1 hr.**
Medical Terminology
Course designed to teach students how to interpret and define medical words by combining prefixes, suffixes, and root words.

MT 140 **3 cr. 5 hr.**
Clinical Laboratory Techniques
Course content includes a study of the clinical laboratory's role in assessing the kidney in health and disease. Both microscopic and chemical analysis of urine are taught with emphasis on correlation of test data to disease diagnosis. Techniques and theory of phlebotomy will also be studied.
Prerequisite: BI 242 or the permission of instructor.

MT 200 **3 cr. 5 hr.**
Basic Hematology
Introduction to the study of the formed elements of the blood. The composition, formation, and function of blood and blood cells will be explored. Routine and special hematology testing methodologies as well as coagulation principles and procedures will be discussed.
Prerequisites: BI 242 or permission of instructor.

MT 300 **3 cr. 3 hr.**
Professional Issues in Clinical Laboratory Science
Course includes introductory principles of medical technology as well as economic, political, and social issues pertinent to health care delivery. Professional and personal ethics, interpersonal communication skills and interview techniques will be covered. Career options for medical technologists and basic education and management strategies will be presented through lecture, discussion and workshops.
Prerequisite: MT 100.

MT 320 **1 cr. 3 hr.**
Immunoassay
Immunoassay is the study of in vitro antigen-antibody reactions. Course examines the theory of serological reactions and practical application of theory to clinical laboratory testing. Procedures such as enzyme assays, immunoelectrophoresis, agglutination and precipitation tests will be studied and performed.
Prerequisite: BI 481, BI 440.

MT 340 **4 cr. 6 hr**
Parasitology/Mycology/Virology
The life cycles, identification, and clincial pathology of parasites found in man. A study of the common mycotic infections of man and methods of identification. An overview of viral structure, oncogenesis, and viral infections of man.
Prerequisite: BI 440

MT 360 **3 cr. 6 hr.**
Clincial Laboratory Data Analysis
A course designed to instruct student in the uses and application of mathematical manipulations involved in the methodology, quality control, method evaluation and pathophysiological correlations of the clinical laboratory.
Prerequisite: MA 170.

MT 400 **6 cr. 9 hr**
Clinical Hematology
An in-depth look at the biology of human blood cells and hemostatic mechanisms. Laboratory tests useful in the detection and differential diagnosis of hematologic diseases will be performed.
Prerequisite: MT 200.

MT 420 **8 cr. 11 hr**
Clinical Chemistry
Principles and techniques currently employed in clinical laboratories; preparation of solutions and care of equipment. Diagnostic tests are performed on all body fluids utilizing manual and the latest instrumental techniques. Theory of chemical manifestations of disease and the interpretation of data are stressed.
Prerequisites: CH 210, 350, MT 360.

MT 440 **6 cr. 9 hr**
Clinical Microbiology
A course designed to prepare students for the isolation, identification, and propagation of pathogenic organisms. Bacteria and their clinical significance to man will be emphasized.
Prerequisites: BI 440, MT 340.

MT 460 **4 cr. 6 hr**
Immunohematology
Basic theory and laboratory techniques in blood banking and serology; common blood types, screening and preparation of donors, crossmatching, antigen-antibody reactions, and serological procedures.
Prerequisites: BI 481.

MT 480, 485 **1 cr. 2 hr.**
Clinical Correlations
A two semester seminar course designed to demonstrate the interrelationships between clinical laboratory disciplines. A case history approach will be utilized to help student integrate laboratory information. Corequisites: MT 400, 420, 440, 460.

MT 490
Independent Study
Open to students who have permission of supervising instructor and department. Course of study, meetings, and project presentation by arrangement.

MT 493 **3 cr. 3 hr.**
Topic in Medicine
Courses have a more narrow focus of those taught on an irregular basis may be offered. New courses may be taught on an experimental basis under this title.

MT 494
Internship

Military Science

Professor:
LTC Joseph Javorski

Asst. Professors:
MAJ. Frank B. Markham
CPT. Raoul Archambaut
MAJ. Barbara Gard

Instuctor:
MSG. Joseph Gengalo

Army Reserve Officers' Training (ROTC) is offered by Fitchburg State College and is available to all male and female students. Physically qualified American citizens under the age of 30 who complete the program may be commissioned as officers in the United States Army, Army National Guard or Army Reserve. Military Science is designed to complement other instruction offered by Fitchburg State and is integrated into the student's regular curriculum.

The ROTC program is based on a four year curriculum composed of a two year Basic Course (freshman and sophomore years) and a two year Advanced Course (junior and senior

years). Students incur no obligation to the Army for participation in the Basic Course. A number of options are offered to meet the special needs of individual students and to provide flexibility within the program:

1. The traditional 4-year program during which the student would take MS courses during the academic year and attend one advanced summer camp between the third and fourth years.

2. The 2-year program designed especially for transfer students from non-ROTC schools, prior military service (National Guard, Army Reserve or Active Army), or those who did not complete all of the Basic Course requirements. In this case, qualified students attend a basic summer camp prior to their third year and then continue through their last two years as any other 4year ROTC student.

3. The third variation consists of a compressed program for students who feel they can complete their academic studies in three years. The recommended compression is to take both the first and second year military science subjects in one year but other arrangements can be made.

No military obligation is incurred for Basic Course subjects. Students contracted into the Advanced Course or who have a scholarship do incur an obligation which may be satisfied through service in the Active Army, National Guard or Army Reserve.

Basic Course

The Basic Course includes the military science subjects taught during the first and second years. It introduces the student to the Army and the Army to the student. Since all effective leaders must understand the organization in which they will function, initial instruction is intended to create a working knowledge of ROTC and the Army. Basic Course offers FSC students the opportunity to learn about the U.S. Army and how it fits into society. The Basic Course is open to any FSC student with no military obligation being incurred. Several field trips are planned during each course.

Advanced Course

The Advanced Course, taught during the third and fourth years, includes topics such as management theory, personnel counseling, ethics, professionalism and professional development, written and verbal communications, military law, law of war, and studies in military areas such as tactics. The objectives are to develop leaders; to give the student experience in organizing and then managing a project; to enable the student to take charge of any project and bring it to a successful conclusion. This acquired ability is useful in every human endeavor; it is essential to the military leader. In conjunction with the theoretical approach to leadership studied in class, students are required to apply their knowledge by participating in a weekly Leadership Laboratory. The Advanced Course is open to all students who have satisfactorily completed two years in the Basic Course or the equivalent.

A student enrolled in the Advanced Course receives an allowance of $100 a month, tax free, from the date of enrollment. To enroll in the Advanced Course, students must execute a contract stating they will complete the program of instruction and accept a commission as a second lieutenant in the U.S. Army upon graduation and serve in the National Guard, Army Reserve or on active duty.

Leadership Laboratory

The purpose of Leadership Laboratory is to give each cadet the opportunity to apply practically the theory learned during formal class periods. The senior cadets conduct the laboratory period with under-classmen filling subordinate roles, their degree of responsibility dependent on how far they have advanced in ROTC.

The Military Science Department encourages its cadets to participate in athletics and to join other extra-curricular activities in order to practice leadership theories learned in Military Science. In the event of schedule conflicts, training periods selected from intersession courses or active participation in one of the ROTC extracurricular activities may be substituted for the required training with prior ROTC advisor approval.

Attendance is mandatory for all scholarship and Advanced Course students. Basic Course students attend based upon the requirements established by their military academic instructor.

MS 140 **1 cr. 1 hr.**
Introduction to Army ROTC
An introduction to the Army ROTC program. Its history, purpose, structure and method will be discussed. Leadership Management responsibilities of an officer are presented. Emphasis will be placed on ROTC and its relationship with the United States Army.

MS 150 **1 cr. 1 hr.**
Introduction to the United States Army
An overview of the role of the "Total Army" within the framework of the national defense establishment. The integrated roles of the Active Army and the Reserve Components are examined. Emphasis is placed on the duties and responsibilities of the officer serving in the combat arms, combat support and combat service support branches.

MS 200 **2 cr. 2 hr.**
Land Navigation and Communications
Students learn the basic fundamentals necessary to navigate and communicate. In Land Navigation, students identify terrain features, find locations, determine directions and plan routes. Maps, protractors, compasses, terrain boards and audio-visual aids are utilized extensively. In the communications portion of this course, students learn radio-telephone procedures, and how to communicate. Principles and techniques derived from this course have application to many other studies.

MS 220 **2 cr. 2 hr.**
Emergency Medical Treatment
This course presents casualty evaluation, treatment and evacuation under emergency conditions. Injury prevention under different climatic conditions is stressed. Cardiopulmonary resuscitation (CPR) Technique is addressed.

MS 310 **2 cr. 2 hr.**
Advanced Theory of Unit Operations
A continuing study of effective leadership in tactical operations, culminating the lessons learned during previous courses; examination of the theory and dynamics of the military team and its effective employment as part of the combined arms concept.
Prerequisites: Completion of Basic Course or advanced placement credit granted by the Professor of Military Science.

MS 330 **2 cr. 2 hr.**
Leadership
A study of the psychology of leadership based on an organizational model. Emphasis is placed on individual, group, transactional and organizational factors that both a leader and manager need to consider in order to be maximally effective. The student is provided with the essentials for forming a creative, personal management and leadership philosophy for practical application in a real-world setting.
Prerequisites: Completion of Basic Course or advanced placement credit granted by the Professor of Military Science.

MS 420 **3 cr. 3 hr.**
Effective Communication
An introduction to the military methods of instruction and basic teaching procedures. Effective speaking, listening, writing and military correspondence, and an emphasis on the interrelationship of staff and command assignments in the effective utilization of people and resources.

MS 430 **3 cr. 3 hr.**
Law, Ethics and Preprofessional Seminar
This course provides the student with an introduction to Military Law and Military Professional Ethics. The role of the junior officer with regard to military law in the practical setting of his/her initial assignment in an Army unit is examined. This course provides the Advanced Course cadet with a basic knowledge of the Army's organizational practices and philosophy. The role of the noncommissioned officer is reviewed along with the basics of line and staff functions. An overview of the Army's personnel management, training, and logistics systems, along with post and installation support organization and functions are presented as a Basic Course.
Prerequisites: Completion of Basic Course or advanced placement credit granted by the Professor of Military Science.

Music

Professor:
Harry Semerjian

Assoc. Professor:
Frank Patterson

Asst. Professor:
Lillian Fagerholm

The Minor in Music
The minor in Music will require 18 semester hours. Students must take the following:

Art of Music I
or
Commonwealth of the Arts
Basic Music Theory
Harmony I
Choral Arts
or
Instrumental Arts

The remaining 6 semester hours may be taken from approved music electives. All education majors selecting the music minor must elect Music in Elementary Education. All minor candidates must pass a first-year piano examination.

*Asterisk indicates that the course is offered infrequently.

MU 100 **3 cr. 3 hr.**
Art Music I
Music as aesthetic experience. Representative styles and categories from the Middle Ages to the present. Students are required to attend professional concerts.

MU 200 **3 cr. 3 hr.**
Commonwealth of the Arts
Music's reflection of the values and ideals of societies past and present. Interrelationships between the fine arts.

MU 220 **3 cr. 3 hr.**
Basic Music Theory
Rhythmic notation including meters and tempo. Melodic notation, including intervals, scales, and keys. Dynamics, an introduction to key relationship, transpositions, as well as other selected topics. No prerequisites.

***MU 230** **3 cr. 3 hr.**
Music Through the Compositional Approach
Students will encounter music through a series of creative projects in varied musical forms. Students must have ready use of a tape recorder and their own tapes. No prerequisites.

MU 310 **3 cr. 3 hr.**
Symphony
Structural and stylistic characteristics of the symphony from the 18th century to the present.

MU 320 **3 cr. 3 hr.**
Opera
Several works from the standard operatic repertoire. Some significant trends in modern opera.

***MU 330** **3 cr. 3 hr.**
Chamber Music
A survey of music written for small ensembles.

MU 340 **3 cr. 3 hr.**
Twentieth-Century Music
The idioms and aesthetic notions of the present century, together with their relationship to the past.

MU 350 **3 cr. 3 hr.**
American Music
American music from colonial times, with some emphasis upon "popular" and "Art" music of the present century in the U.S.

MU 360 **3 cr. 3 hr.**
Baroque and Classical Music
Monteverdi to Beethoven. Opera, oratorio, passion, cantata, sonata forms, dance forms, shifting aesthetic views.

370 **3 cr. 3 hr.**
Romantic Music
A survey of major forms of 19th century music from Beethoven to Mahler.

MU 400 **1 cr. 2 hr.**
Choral Arts
Singing choral music past and present, including dramatic music. No more than 6 semester hours applicable toward graduation. Available for audit. (See MU 410.)

MU 410 **1 cr. 2 hr.**
Instrumental Arts
Small and large ensemble playing of representative works for instruments including band and jazz ensemble literature. No more than 6 semester hours of MU 410 or any combination of MU 410 and MU 400 applicable toward graduation. Available for audit.

MU 420 **1 cr. 2 hr.**
Class Piano
Practical keyboard usages in classroom work: accompaniment, simple transposition, harmonizaion of melodies at the keyboard.

MU 430 **1 cr. 2 hr.**
Class Voice
Principles of voice production. Breath control, phrasing, resonance, and diction are stressed.

***MU 440** **3 cr. 3 hr.**
Song
Popular, folk, and art songs of many nations.

MU 450 **3 cr. 3 hr.**
Harmony I
Harmonizations of simple melodies. Principles of modulation and key relationships.

***MU 451** **3 cr. 3 hr.**
Harmony II
Further work in modulation. Chromaticism. Late 19th and early 20th century developments.
Prerequisite: MU 450 or equivalent.

***MU 470** **3 cr. 3 hr.**
Compositional Techniques
Working with small musical forms. Traditional devices like sequence, ostinato, motivic development. Freer forms.

***MU 471** **3 cr. 3 hr.**
Musical Production
Workshop approach to producing and rehearsing opera, operetta musical comedy.

MU 480 **3 cr. 4 hr.**
Music in Elementary Education
The objectives and techniques of teaching music in the first six grades.

MU 490 Independent Study in Music

MU 493 **3 cr. 3 hr.**
Topics in Music
Courses having a more narrow focus or those taught on an irregular basis may be offered. New courses may be taught on an experimental basis under this title

Nursing

Chairman:
Barbara Madden

Professors:
Rita Driscoll
Sheila Fredette
Barbara Madden

Assoc. Professors:
Lillian Bannon
Elizabeth May
Katherine O'Connor
Tanya Ratney

Asst. Professors:
Virginia Doyle
Elizabeth Fisk
Sophia Harrell
Catherine Humphreys
Barbara May
Linda McKay
Jane Minasian
Eileen O'Neill
Rowena Taylor
Andrea Wallen

Instructors:
Michelle Brady
Sarah Hitchcock
Carol Picard
Elizabeth Shaw
Richard Trifilo
Lynn Wagner
Jean Worfolk

Part-Time Instructors:
Belinda Asano
Sandra Austin
Joanne Chapman
Gail Consolatti
Katharine Gimbel
Jean Kressy
Barbara MacDonald
Marianne MacLean
Mildren Marion
Judith Mizhir
Barbara Powers
Helen Rogers

Purpose
The purpose of the Fitchburg State Bachelor of Science Degree in Nursing is to prepare a practitioner of professional nursing who can assume responsibility for planning and providing health care to individuals, groups and communities in collaboration with other health professionals. To accomplish this purpose the degree program requires a balance of general education and nursing studies. The following are the requirements of the degree, a nursing curriculum plan, and a program for registered nurses who desire a baccalaureate degree.

Bachelor of Science, Major in Nursing
(125 semester hours-63 semester hours in Nursing)

Note: Students are required to have a quality point ratio in nursing courses at the end of each semester equal to the cumulative quality point ratio required for overall course work in order to progress to the next nursing course. Any student on academic probation in nursing can not be admitted to NS 470 or NS 480, or to

electives in nursing. Note: Liability insurance coverage and health clearance is required for all clinical nursing courses. CPR certification must be maintained.

**Students are responsible for providing their own transportation for clinical practice.*

Nursing Curriculum Plan

Freshman Year

Anatomy and Physiology I	*3*
Chemistry I	*4*
**General Psychology*	*3*
English Composition I	*3*
Elective	*3*
	16
Anatomy and Physiology II	*3*
Chemistry II	*4*
**Intro. to Sociology*	*3*
English Composition II	*3*
Elective	*3*
	16

Sophomore Year

The Nurse: Concept and Practice I	6
*Human Growth and Development	3
*Applied Statistics	3
Elective	3
	15
The Nurse: Concept and Practice II	6
*Scientific Foundations for Nursing Interventions	3
Survey of Microorganisms	3
Electives	6
	18

Junior Year

Nursing Interventions: Concept and Practice I	12
Elective	3
	15
Nursing Interventions: Concept and Practice II	12
Electives	6
	18

Senior Year

Nursing in Society: Concepts and Practice	10
Contemporary Professional Issues	2
Elective	3
	15
Nursing: Selective Practicum	12

**May be taken either semester.*

Bachelor of Science, Major in Nursing for Registered Nurses

Applicants must meet the regular college requirements for admission which include the following: 1. Application filed by April 1; 2. Official transcripts from (a) High School (b) diploma or associate degree program and (c) colleges and universities attended. In addition to the above requirements, in order to be eligible for nursing courses, registered nurses must successfully complete two of the eight-credit nursing exemption exams offered in place of the sophomore and Junior basic nursing courses. These examinations are developed by the faculty in the Department of Nursing and administered by the CLEP Program Director once each month. Further information including application for the examinations, course outlines and bibliographies may be obtained from the Nursing Department. It is also recommended that an interview be arranged with the coordinator of the registered nurse program.

Program Plan for Registered Nurses

Students must meet the General Education Distribution Requirements as established for the basic nursing curriculum. Registered nurses may receive credit for General Education through the CLEP Program and teacher made examinations. At the present time, teacher made examinations are offered for Anatomy and Physiology, Human Growth and Development, Survey of Microorganisms and Scientific Foundations for Nursing Interventions. These exams are also offered through the office of the CLEP Program. The complete list of CLEP examinations through which students may earn credit is also available from that office.

Nursing Distribution

Nursing Exemption Examinations, 24 semester hours; Scientific Foundations for Nursing Interventions, 3 semester hours; Concepts of Nursing I, 6 semester hours; Concepts of Nursing II, 6 semester hours; Contemporary Professional Issues, 2 semester hours; Nursing in Society: Concepts and Practices, 10 semester hours; and Nursing: Selective Practicum, 12 semester hours. Total required credits is 63.

In order to enter the senior year, students must have completed all three 8-credit nursing exemption examinations, NS 350 and 360, Scientific Foundations for Nursing Interventions, Anatomy and Physiology I and II, Chemistry I

and II, Survey of Microorganisms, General Psychology, Introduction to Sociology, Human Growth and Development, Applied Statistics, and English Composition I and II.

The senior year may be taken full-time (see basic curriculum plan) or part-time over two years by taking Nursing in Society over two semesters (NS 471 and NS 472) and Selective Practicum over two semester (NS 481 and NS 482).

NS 000 **0 cr. 1.5 hr.**
Preparation for Entry into Practice
The elective senior course assists students with the process of licensure preparation through exercises in self-assessment, stress control, test-taking skill development and exam simulation.

NS 101 **1 cr. 1 hr.**
Introduction to Nursing
An overview of the roles of professional nursing within the health care system today and their historical precedents. The nurse as a promoter of optimum wellness, and differing views of health and illness are explored.

NS 270 **6 cr. 8 hr.**
The Nurse: Concept and Practice I
Theoretical and methodological concepts provide the framework for assisting the student to develop as a person and a learner. Concepts such as health, interpersonal skills, professionalism and nursing process are explored. Laboratory experiences are provided for the practice of affective and psychomotor skills.
Prerequisites: BI 120, BI 130, CH 130, CH 140, PY 110, SO 110, EN 100, EN 120.

NS 280 **6 cr. 8 hr.**
The Nurse: Concept and Practice II
This course assists the student in applying the theoretical foundations acquired in NS 270. An exploration of the nursing process continues, and concepts relating to the health promotion needs of the expectant family are also included. Students are expected to appropriately utilize the nursing process at a beginning level in clinical settings with clients in selected developmental phases which include the elderly and healthy pregnant women.
Prerequisite: NS 270.

NS 285 **3 cr. 3 hr.**
Scientific Foundations for Nursing Interventions
This course assists the student to understand basic alterations in physiology underlying nursing assessment, diagnosis and intervention. Open to non-majors.
Prerequisites: B1 120, BI 130, CH 130, CH 140.

NS 300 **2 cr. 2 hr.**
Women and Health Care
This elective course explores the past, present and future roles of women as health care consumers and providers. The impact of sexism and feminism on the delivery of health care is examined. Current women's health care issues are addressed, including unnecessary surgery, contraception, eating disorders, disability, etc. The analysis focuses on women as health care workers with a special emphasis on nursing and the Women's Health Movement. Open to non-majors.

NS 310 **3 cr. 3 hr.**
Pharmacology: Personal and Professional Perspectives
This elective course deals with principles of pharmacology in their application to personal and professional situations. Although the focal point is drug classifications, prototypes are considered in terms of their principal effects. Students will have the opportunity to explore an area of interest in depth. Open to non-majors.
Prerequisites: BI 120, BI 130, CH 130, CH 140.

NS 320 **2 cr. 2 hr.**
Health Promotion in the Child From a Developmental Perspective
This elective course identifies major components of preventive health care from infancy through adolescence. Its focus is to plan interventions for maintenance and promotion of health. Open to non-majors.
Prerequisite: PY 220.

NS 350 **6 cr. 9 hr.**
Concepts of Nursing I
The advanced placement student is provided with a quality learning experience to broaden his/her perspective of professional nursing. Students are expected to demonstrate their expertise in the use of the nursing process by working with clients.
Prerequisites: Two of the eight-credit nursing exemption examinations.

NS 360 **6 cr. 9 hr.**
Concepts of Nursing II
Through the process of critical thinking the concepts and theories of nursing and health are further developed and practiced with clients in settings chosen by the students.
Prerequisite: NS 350.

NS 370 **12 cr. 20 hr.**
Nursing Intervention: Concept and Practice I
The totality of humans as bio-psycho-social beings is emphasized. The frame of reference is the internal environment. Concepts directed toward stabilizing this environment as well as concepts and theories of nursing and health are discussed, broadened and increased in depth. Clinical experience in a variety of settings is an integral component of this course.
Prerequisites: NS 280, NS 285, PY 220, MA 170, BI 270.

NS 380 **12 cr. 20 hr.**
Nursing Intervention: Concept and Practice II
The student continues to explore concepts of the bio-psycho-social nature of humans. The concepts of health, nursing and environment will be further explored. Clinical experience in a variety of settings is an integral component of this course.
Prerequisite: NS 370.

NS 410 **2 cr. 2 hr.**
Holistic Health: Alternative Approaches to Health Care
This elective course explores the integration within the individual of the body, mind, spirit and environment. It utilizes the technically advanced aspects of modern medical science while recognizing the wisdom of valid alternatives to standard Western medicine. General approaches as well as specific modalities are discussed.
Prerequisite: NS 360 or NS 380.

NS 420 **2 cr. 2 hr.**
Contemporary Professional Issues
This course provides an opportunity for senior nursing students to identify, explore, and discuss some of the critical issues and trends affecting nursing today; including rights and responsibilities relative to professional organization and practice and opportunities for employment after graduation. This course is offered concurrently with NS 470.

NS 430 **2 cr. 4 hr.**
Promoting Mental Health in the Acute Psychiatric Setting
This elective course provides students the opportunity to apply knowledge of psychiatric-mental health nursing theory and principles in the acute in-patient setting.
Prerequisite: NS 370.

NS 440 **2 cr. 2 hr.**
Holistic Care of the Person with Cancer
This elective course is a synthesis of prior nursing theory within a paradigm of caring for the person with cancer. The nursing process will be utilized as the framework for examing psychological, physiological and educational needs. Current concepts from research and literature in nursing and related sciences will be presented.
Prerequisite: NS 370.

NS 470 **10 cr. 16 hr.**
Nursing in Society: Concepts and Practice
or
NS 471 **5 cr. 7 hr.**
and
NS 472 **5 cr. 9 hr.**
General systems theory and the nursing process provide the framework of the course. Subsystems considered are group, family and community. An holistic approach is used to assess the interdependence between the clients' health and the environment. Nursing intervention is planned on the primary, secondary, and tertiary levels.
Prerequisites: NS 380 or NS 360 plus all previously noted prerequisites to NS 380.

NS 480 **12 cr. 28 hr.**
Nursing: Selective Practicum
or
NS 481 **6 cr. 14 hr.**
and
NS 482 **6 cr. 14 hr.**
This course provides students with the opportunity to explore in depth particular areas of interest. The purpose of the experience is to encourage the synthesis of all previous learnings, The concepts of critical thinking, leadership skills, communication skills, and research underlie the course of study. The student is required to select a variety of guided clinical experiences during the semester.
Prerequisites: NS 420 and NS 470.

NS 490 Independent Study

NS 493 **3 cr. 3 hr.**
Topics in Nursing
Course having a more narrow focus or those taught on an irregular basis may be offered. New courses may be taught on an experimental basis under this title.

Philosophy

Professors:
James Colbert
Richard DeCesare
Walter Jeffko

Assoc. Professor:
Richard Glidewell

Philosophy Minor
The Philosophy Minor requires 15 semester hours. There is a pre-requisite of PL 100 or PL 310. Courses for the minor must include a) either PL 331 or PL 332 and PL 359 or PL 361; b) at least one course from the following: PL 340, 350, 360, 420, 450 and 466, and c) two additional philosophy courses.

*Asterisk indicates that the course is offered infrequently

PL 100 **3 cr. 3 hr.**
Introduction to Philosophy
An introduction to the problems, methods, and goals of classical and contemporary Western Philosophy. Emphasis is placed upon how these differ from and relate to other fields of human knowledge.

PL 300 **3 cr. 3 hr.**
Philosophy of Education
This course seeks to trace the origin and development of major educational theories and their contemporary implications.

PL 310 **3 cr. 3 hr.**
Logic
An introduction to logical thinking from the perspective of both traditional and modern logic. The following topics are covered: difference between deduction and induction, language and definition, fallacies, categorical propositions, categorical syllogisms, deductive arguments in ordinary language, and selected topics in symbolic logic.

***PL 320** **3 cr. 3 hr.**
Theories of Knowledge
The problems and methods of human knowledge. Theories presented in the light of idealism, realism, pragmatism, and existentialism.
Prerequisite: PL 100.

***PL 330** **3 cr. 3 hr.**
Metaphysics
Introduction to the origin and development of metaphysical problems in Western Philosophy.
Prerequisite: PL 100.

***PL 331** **3 cr. 3 hr.**
Ancient Philosophy
A study of the beginnings of Western Philosophy, including the Pre-Socratics, Plato, Aristotle, and several other figures of the period.
Prerequisite: PL 100.

***PL 332** **3 cr. 3 hr.**
Medieval Philosophy
Includes St. Augustine, Boethius, Albertus Magnus, Avicenna, Averroes, Maimonides, and St. Thomas, and their influence upon subsequent philosophy.
Prerequisite: PL 100.

***PL 333** **3 cr. 3 hr.**
Modern Philosophy
Trends of modern thought since the Renaissance, including Descartes, Locke, Spinoza, Leibniz, Hume, Kant, and Hegel.
Prerequisite: PL 100.

PL 334 **3 cr. 3 hr.**
Contemporary Philosophy
An examination of some current trends and issues in contemporary American, British, and European philosophy.
Prerequisite: PL100.

PL 340 **3 cr. 3 hr.**
Contemporary Ethical Systems
Moral experience and reflective ethics; survey and critical evaluation of major ethical theories; ethics and science.

PL 350 **3 cr. 3 hr.**
Contemporary Ethical Problems
Application of ethical thinking to some of today's major social and personal issues including crime and punishment, civil disobedience, prejudice and discrimination, sex, abortion, war, and suicide and death.

PL 360 **3 cr. 3 hr.**
Philosophy of Man
An exploration of human nature or personhood from the triple perspectives of philosophy, religion, and behavioral science, focusing upon the following thinkers and movements; Plato, Christianity, early modern indivdualism, Marxism, Freud, existentialism, Frankl's logotherapy, Skinner, Fromm's humanism and personalism.

PL 361 **3 cr. 3 hr.**
Contemporary Philosophy
An examination of some current trends and issues in contemporary American, British, and European philosophy.
Prerequisite: PL 100.

***PL 400** **3 cr. 3 hr.**
Existentialism
Origin of contemporary existentialism; its leading ideas as seen in writings of such philosophers as Kierkegaard, Jaspers, Marcel, Sartre, and Camus.
Prerequisite: PL 100.

PL 410 **3 cr. 3 hr.**
Philosophy of Art
An examination of the interpretations of aesthetic experience presented by such thinkers as Aristotle, Tolstoy, Shiller, Bergson, Spengler, and Dewey.
Prerequisite: PL 100.

PL 420 **3 cr. 3 hr.**
Political and Social Philosophy
The various political and social ideas beginning with Plato and continuing to Marx.
Prerequisite: PL 100.

PL 430 **3 cr. 3 hr.**
Philosophy of Science
An analysis of the methods and goals of the physical sciences, how they differ from the social sciences, and the philosophic problems encountered in scientific pursuits.

PL 440 **3 cr. 3 hr.**
Philosophy of Language
The role played by language in human knowledge and the increased emphasis on the analysis of language in recent philosophy.
Prerequisite: PL 100.

***PL 443** **3 cr. 3 hr.**
Marxism
A study of Marx's thought, its origins, development, and contemporary applications.
Prerequisite: PL 100.

***PL 444** **3 cr. 3 hr.**
Early American Philosophy
A study of American thought from the Colonial Period through 19th century.

***PL 445** **3 cr. 3 hr.**
Contemporary American Philosophy
An examination of the current trends and issues in American thought.

PL 447 **3 cr. 3 hr.**
Seminar Special Topics

PL 450 **3 cr. 3 hr.**
Philosophy of Love
An analysis of the concept "love" as employed in the social and moral philosophies of various classical and contemporary thinkers.
Prerequisite: PL 100.

***PL 460** **3 cr. 3 hr.**
Philosophy of Religion
The God-problem and religious experiences as seen in the classical philosophers and in the philosophies of existentialism and pragmatism.
Prerequisite: PL 100.

PL 461 **3 cr. 3 hr.**
Comparative Religious Experiences
This course studies the principal religions of mankind: Buddhism, Islamism, Judaism, and Christianity; their basis tenets and insights into spiritual values.

PL 465 **3 cr. 3 hr.**
Man and Nature I
This course is based, in part, on the Ascent of Man film series by Jacob Bronowski. It covers a broad range of topics centering on those discoveries, ideas, and events which have been crucial to the development of modern civilization. The origin of man, ancient civilizations, early mathematics and astronomy are among the topics covered.

PL 466 **3 cr. 3 hr.**
Man and Nature II
A continuation of PL 465 covering the period from the trial of Galileo to the present, dealing with such topics as evolution, nuclear physics, the theory of relativity, and the human brain.

PL 468 **6 cr. 6 hr.**
Adventures in Ideas
A study of the major ideas of Western man and their influence on our lives and our thoughts. Each semester several basic modes of thought are studied and the class explores how each idea manifests itself in literature, science, philosophy, etc. Classes are combinations of lecture and group discussion with considerable emphasis placed on individual student exploration of these major ideas.

PL 490
Independent Study
Open to students who have permission of the supervising instructor and the department. Course of study, meetings, and credit by arrangement.

PL 493 **3 cr. 3 hr.**
Topics in Philosophy
Courses having a more narrow focus or those taught on an irregular basis may be offered. New courses may be taught on an experimental basis under this title.

Physical Education

Chairman:
Thomas Battinelli

Professors:
Thomas Battinelli
Lee N. Cunningham

Asst. Professors:
David Antaya
Joyce Downey
Barbara Nole
James Sheehan
Caryl Sickul

The Physical Education programs in Exercise Science, Physical Education, Recreation, and Dance are designed to provide students with an opportunity to pursue:

1. Study in an alternative field of interest.
2. Prerequisite study for further graduate work.

BIOLOGY/EXERCISE SCIENCE TRACK

Exercise Science Course Requirements	***(12)***
PE 412 Biomechanics of Sport	(3)
PE 404 Behavioral Concepts of Sport	(3)
PE 307 Exercise and Sport Science	(3)
BI 495 Internship	(3)

Education/Physical Education Minor*

Physical Education Professional Course Requirements	***(12)***
PE 307 Exercise and Sport Science	(3)
PE 403 Physical Education: An Overview	(3)
PE 404 Behavioral Concepts of Sport	(3)
PE 308 Scientific Foundations of Athletic Training and Conditioning	(3)
Physical Activity Course Requirements	(6)

* For Education (Elementary and Secondary) and Human Services Majors. Majors in Human Services may substitute Recreational Leadership (PE 401) and Camp Counseling (PE 402) in place of Behavioral Concepts of Sport and Scientific Foundations of Athletic Training and Conditioning.

Human Services/Recreation/Dance
Specializations
Specialization I
Recreation **16 credits**

Professional Course Requirements	***(12)***
PE 406 Outdoor Education	(3)
PE 411 Programs in Recreation	(3)
PE 401 Recreational Leadership	(3)
Recreational Management (proposed)	(3)

Physical Activity Course Requirements	***(4)***
PE 028 Orienteering	(1)
PE 108 Backpacking	(1)
PE 020 Cross-Country Skiing	(1)
PE 025 Cycling	(1)
PE 017 Introduction to Mountain Hiking	(1)
PE 015 Canoeing	(1)
PE 030 Recreational Sports	(1)
PE 013 Dance Aerobics	(1)
PE 021 Modern Jazz	(1)

Specialization II
Dance ***16 credits***

Professional Course Requirements	***(12)***
PE 405 Art of Dance	(3)
PE 407 Introduction to Dance Movement Therapy	(3)
PE 413 Making Dances Choreography and Composition	(3)
PE 410 Movement Education	(3)
Physical Activity Course Requirements	***(4)***
PE 026 Contact Improvisation	(1)
PE 027 Creative Movement	(1)
PE 013 Dance Aerobics	(1)
PE 021 Modern Jazz I	(1)
PE 022 Modern Jazz II	(1)
PE 023 Modern Jazz III	(1)

Specialization III
Recreation/Dance ***(16)***

Professional Course Requirements	***(12)***
PE 411 Programs in Recreation	(3)
PE 401 Recreational Leadership	(3)
PE 407 Introduction to Dance Movement Therapy	(3)
PE 413 Making Dances	(3)

Choreography and Composition

Physical Activity Course Requirements	***(4)***
PE 018 Backpacking	(1)
PE 015 Canoeing	(1)
PE 020 Cross Country Skiing	(1)
PE 025 Cycling	(1)
PE 017 Introduction to Mountain Hiking	(1)
PE 028 Orienteering	(1)
PE 030 Recreational Sports	(1)
PE 026 Contact Improvisations	(1)

PE 027 Creative Movement (1)
PE 013 Dance Aerobics (1)
PE 021, 022 or 023 Modern Jazz I, II, or III (1)

Health and Fitness Requirement
In order to meet the Health and Fitness requirement, students may select one of the following options: one course from Option I, three courses from Option II, or two courses from Option II and one from Option III.

Option I

PE 100 **3 cr. 3 hr.**
Health and Fitness
A basic survey of the effects of diet, exercise and selected environmental agents upon human, mental and physical health. Topics may include body build and body composition, fitness evaluation and programming, nutritional considerations, psychological correlates of health, chemical alterations, human sexuality, and personal and public health.

PE 305 **3 cr. 3 hr.**
Adaptations
The human organism is examined in terms of its adaptation to acute and chronic stress. Physiological responses to such stressors as exercise, heat, and darkness, altitude and nutrition are studied theoretically and in a laboratory setting.

PE 306 **3 cr. 3 hr.**
Body Build and Physical Performance
This course is designed to provide students with an overview of the field of body build relative to structure, size, and composition and the study of exercise, nutrition, and heart disease. Body build and body composition assessments will be made, exercise prescriptions and programs will be developed, and prevalent controversies in the areas of nutrition and heart disease will be examined.

PE 307 **3 cr. 3 hr.**
Exercise and Sport Science
Basic exercise physiology is explored as it relates to the health professions. Theoretical topics include orientation to exercise, movement and energy production, neurological aspects of movement, and circulatory, respiratory, and hormonal factors in exercise. Practical topics include: cardiovascular stress testing, nutrition and weight control, physique and body composition, fitness, programming, the female in sports, the influence of activity on growth, evaluation of muscular strength, respiratory responses to exercise, and environmental effects such as altitude and temperature.

PE 308 **3 cr. 3 hr.**
Scientific Coundations of Athletic Training and Conditioning
A course designed to discuss the principles of injury prevention and care, the physiology of training and nutritional considerations as they apply to athletics.

PE 309 **3 cr. 3 hr.**
Jogging: Theory and Practice
The scientific basis for cardiovascular training programs using jogging as the mode of activity will be presented. Pre and post cardiovascular and body compostiion evaluations and individualized jogging programs will be designed.

Option II PE 200 **1 cr. 2 hr.**
Psychology of Sport
A basic overview of the psychological impacts of sport upon participants and spectators. The areas of winning and losing, competition behavior modification, women in sport, and the study and analyzation of emotional reaction profiles will be used in the observation of emotional behaviors.

PE 201 **1 cr. 2 hr.**
The Cardiovascular System and Exercise
The preventitive aspects of endurance exercise and nutrition as related to the cardiovascular system will be studied in a lecture-laboratory format. Each student will be tested before and after a cardiovascular training program using a series of assessment techniques which will include an exercise ECG, estimated maximal oxygen consumption, blood pressure, lung function, muscular strength, flexibility and body composition.

PE 202 **1 cr. 2 hr.**
Introduction to Kinesiology
An overview of the study of the mechanics of human motion will be presented. This course is designed to integrate kinesiological principles to the teaching of selected motor activities.

PE 203 **1 cr. 2 hr.**
Consumer Health
This course is designed to help the student evaluate health information critically, and select products and services wisely. The past, present, and future of quackery will be explored

especially in the areas of food, cosmetics, and chronic disorders. Laws and protection agencies, governmental and private, will be surveyed.

PE 204 **1 cr. 2 hr.**
Diet, Exercise and Weight Control
The course is designed for those interested in weight loss or weight maintenance through the medium of diet and exercise. After an initial assessment of body composition, endurance fitness and the establishment of dietary goals, each student will work toward the normalization of body weight through actual programs of exercise and diet.

PE 205 **1 cr. 2 hr.**
Sports Concepts
Physical activity skills for team sports will be viewed from the physiological and values perspective. Students will practice physical activity and value techniques.

PE 206 **1 cr. 2 hr.**
Controversies in Nutrition
This course is designed to study the nutritional issues prevalent today. The available evidence will be presented to explain, clarify, and summarize the positions taken by investigators in the field.

PE 207 **1 cr. 2 hr.**
Figure Control Through Weight Training
The theory of weight training and diet in relation to figure control will be discussed. Each student will have physique, body composition, aerobic fitness and muscular strength evaluations before and after a weight training program.

PE 208 **1 cr. 2 hr.**
Weight Training for Athletes
Theory for the development of muscular strength for specific athletic activities. Anthropometric, body composition, and muscular strengths evaluations will be undertaken prior to and following an individually developed weight training program.

PE 209 **1 cr. 2 hr.**
First Aid and Safety
A behaviorally oriented course structured for those responsible for the safety and protection of others. Official Red Cross certification will be issued upon satisfactory completion of course.

PE 210 **1 cr. 2 hr.**
Physical Education for the Orthopedically Handicapped
The course will include an overview of congenital, postural, and degenerative orthopedic problems. It is designed to aid the student plan suitable corrective exercises and activity programs for people with these special needs.

PE 211 **1 cr. 2 hr.**
Techniques of Road Racing
The purpose of the course is to acquaint the student with various topics of running long distance road races. Topics include the physiology of running, training strategies, injury care and prevention, nutritional aspects and methods of assessing running ability. Each student will undertake a training program, serve on a committee to organize a road race and participate in three road races.

Option III
Activity courses are taught on a half-semester basis. Each half semester carries 2 clock hours and credit.

PE 001 Basketball
PE 002 Volleyball
PE 003 Softball
PE 004 Tennis
PE 005 Advanced Tennis
PE 006 Badminton
PE 007 Karate
PE 008 Judo
PE 009 Gymnastics
PE 010 Slimnastics
PE 011 Rhythmics
PE 012 Aerobics
PE 013 Dance Aerobics
PE 014 Folk Dance
PE 015 Canoeing
PE 016 Tumbling
PE 017 Introduction to Mountain Hiking
PE 018 Backpacking
PE 019 Downhill Skiing
PE 020 Cross Country Skiing
PE 021 Modern Jazz I
PE 022 Modern Jazz II
PE 023 Modern Jazz III
PE 024 Horseback Riding
PE 025 Bicycle Touring
PE 026 Contact Improvisation (Movement/Dance)
PE 027 Creative Movement
PE 028 Orienteering
PE 029 Soccer
PE 030 Recreational Sports
PE 031 Afro Jazz Dance

Professional Courses

***PE 400** **3 cr. 3 hr.**
Fundamentals of Coaching
An analysis of the principles and practices of coaching in various sports will be presented for the prospective teacher-coach.

PE 401 **3 cr. 3 hr.**
Recreational Leadership
The organization and administration of recreational activities will be presented in reference to the development of the principles and practices in both school and community programs. Leadership experience with school and community programs will also be offered.

***PE 402** **3 cr. 3 hr.**
Camp Counseling
Course content provides an opportunity to study some of the problems in the field of camping, to acquire skills essential in camp life and to develop leadership in individual and group work.

PE 404 **3 cr. 3 hr.**
Behavioral Concepts of Sport and Fitness
This course is designed to provide students with an overview of the field of sport psychology and the study of motor learning and performance. The behavioral concepts of personality, motivation, aggression, and leadership common to sports and fitness will be examined. Motor learning theory and the factors and processes related to skill acquistion will also be covered.

PE 405 **3 cr. 3 hr.**
Art of Dance (Humanities Credit)
This course offers students the opportunity to experience dance aesthetically and kinesthetically. Representative style forms from tribal dance through the Renaissance period to the present will be covered. Films, movement labs and concerts will also be included.

PE 406 **3 cr. 3 hr.**
Outdoor Education
This course is designed to explore the use of the outdoors as a medium in the educational process. Topics will include: introduction to outdoor education, teaching methodology, basic principles of high adventure activities, school camping and outdoor education programs.

PE 407 **3 cr. 3 hr.**
Introduction to Dance Movement Therapy
The purpōse of this course will be to study dance therapy through movement processes designed to further physical, emotional, and spiritual integration. Kinesthetic principles and practices will be explored through structured and improvised movement experiences. Effort-Shape Analysis and Chase-Movement Therapy techniques will be utilized to enable students to increase their movement ranges, discover their own movement preferences, and develop leadership skills.

PE 408 **1 cr. 2 hr.**
Physical Education in the Elementary School
A theory and practice course designed to guide the classroom teacher in organizing a comprehensive program of physical education activities.

PE 409 **3 cr. 3 hr.**
Officiating Basketball and Volleyball
The philosophy and techniques of officiating basketball and volleyball for women, DGWS rules are used for both sports, and an opportunity is presented to take the written and practical national examination to obtain a rating in either or both sports.

PE 410 **3 cr. 3 hr.**
Movement Education
Movement Education is a theoretical and an experiential course designed for working with the creative process in an interdisciplinary manner. The relationship of movement in developmental processes will be explored. Movement experiences, group leadership, curriculum development and evaluation will be covered.

PE 411 **3 cr. 3 hr.**
Programs in Recreation
This course is designed to acquaint students with different types of programs in the recreation field. The development of traditional and innovative programs will be explored and evaluated. Topics will include: program foundations, traditional and innovative curricula, program planning, implementation and evaluation.

PE 412 **3 cr. 3 hr.**
Biomechanics of Sport
The study of human motion in relation to anatomical and mechanical concepts. Specific sport and exercise activities will be studied based upon these considerations using video tape and film analysis.

PE 413 **3 cr. 3 hr.**
Making Dances: Choreography and Composition (Humanities Credit)
Opportunities to develop and analyze the architectural structure and imagery content of dances and music through effort/shape theory. Each participant will work improvisationally, and as choreographer and dancer in the development of solo, small group and large group pieces.

PE 490
Independent Study
Open to students who have permission of the supervising instructor and the department. Course of study, meetings, and credit by arrangement.

PE 493 **3 cr. 3 hr.**
Topics in Physical Education
Courses having a more narrow focus or those taught on an irregular basis may be offered. New courses may be taught on an experimental basis under this title.

Physics

Chairman:
Esmail Valanejad

Professors:
Esmail Valanejad
Norman Fredette

PH 101, 102, 103 and 104 are for non-science majors and are strongly recommended to students at large for satisfying their General Education requirements.

PH 115 physics for the life sciences is a special one-semester course for medical technology students.

PH 130, 140 are for computer science, chemistry, mathematics, industrial science majors.

PH 210, 220, 310, 320, 410, and 420 are all advanced courses that will be offered from time to time in the form of free electives to those students who have had PH 130 and 140 and have shown keen interest in Physics and Mathematics.

PH 101, 102 **3 cr. 4 hr.**
Physical Science I and II
For the non-scientist. Emphasis is upon the building of conceptual models, problem solving techniques, and the processes of science.

PH 103 **3 cr. 4 hr.**
Astronomy
A study of planetary motion, the sun, stars, and galaxies. An observing program. A background of algebra is assumed.

PH 104 **3 cr. 4 hr.**
Environmental Physical Science
The study of (1) the environment, (2) the effects of pollution on the environment, ecosystems, and natural balance and (3) relevant background material in physical science as needed. Prerequisite: Physical Science I, Earth, Sea and Air, or equivalent.

PH 115 **4 cr. 6 hr.**
Physics for the Life Sciences
An introduction to Physics which includes a brief treatment of force, work and energy and an emphasis on the nature of waves, optics and electricity.

PH 130 **4 cr. 5 hr.**
General Physics I
Mechanics: Straight line motion; circular motion; Kepler's law of planetary motion; universal gravitation; work; energy; power; conservation of energy and momentum; simple harmonic motion. Hydrostatics and hydrodynamics: Archimedes' principle, Bernouli's equation, viscosity, Stokes law, Reynolds number. Heat and thermodynamics: heat and heat measurements; transfer of heat; thermal properties of matter; the laws of thermodynamics; kinetic theory of gases.

PH 140 **4 cr. 5 hr.**
General Physics II
Electricity and Magnetism: Coulomb's law, electric field, electric potential, capacitance, electric circuits, magnetic field, magnetic forces on a current-carrying conductor, magnetic field of a current, induced e.m.f., magnetic properties of matter. Geometrical Optics: Laws of reflection and refraction; mirrors; lenses; optical instruments; eye and its optical defects and their correction; illumination and color. Physical Optics: interference and diffraction; polarization.
Prerequisite: PH 130.

PH 210 **4 cr. 5 hr.**
General Physics III
Atomic and Nuclear Physics: Electronic configuration of the atoms; Bohr atom; atomic spectra; X-rays; radioactivity and radiation hazards.
Prerequisite: PH 140.

PH 220 **3 cr. 3 hr.**
Intermediate Mechanics
Calculus and delta methods are used in an analytical study of Newtonian mechanics with application to nonconservative forces, central forces, and rotational dynamics. Linear oscillator, free and forced oscillations, damping, vibrating string, traveling and standing waves.
Prerequisite: PH 130 or equivalent.

PH 270 **3 cr. 3 hr.**
Physics for Industrial Technology
This is a course in elementary Physics with particular emphasis on applications in the area of industrial technology. Topics include kinematics, statics, dynamics, work and energy, simple machines, fluid dynamics, and heat transfer.

PH 310 **3 cr. 3 hr.**
Quantum Mechanics
Inadequacies of classical physics, uncertainty principle, Schrodinger equation, physical interpretation of wave function, energy levels, harmonic oscillator, hydrogen atom, perturbation theory.
Prerequisites: PH 210 and MA 240.

PH 320 **3 cr. 3 hr.**
Electricity and Magnetism
After a preliminary introduction to vector algebra, electrostatic as well as magnetostatic fields in vacuum and material media are discussed. Maxwell's equations and propagation of electromagnetic waves are considered.

PH 410 **3 cr. 3 hr.**
Statistical Mechanics and Thermodynamics
Laws of thermodynamics, entropy, Carnot cycle, kinetic theory of gases, Bose and Fermi gases, low temperature physics.
Prerequisite: PH 310.

PH 420 **3 cr. 4 hr.**
Solid State Physics
Short review of quantum mechanics, crystal structure magnetism semiconductor theory, specific heat of solids.
Prerequisite: CS 160.

PH 490
Independent Study
Open to students who have permission of the supervising instructor and the department. Course of study, meetings, and credit by arrangement.

PH 493 **3 cr. 3 hr.**
Topics in Physics
Courses having a more narrow focus or those taught on an irregular basis may be offered. New courses may be taught on an experimental basis under this title.

Political Science

Professor:
Donald Norton

Assoc. Professor:
Shirley Wagner

Courses in political science are intended for any student with a general interest in politics and government. They are also designed to provide a proper background for students interested in pursuing graduate study or a career in law, public administration, or government and political science. It is recommended that these students take six hours of Modern American Government and six hours of electives.

Modern American Government, PS 100 and PS 200 or the consent of the Instructor are required for all other courses in Political Science.

PS 100 **3 cr. 3 hr.**
Modern American Government: State and Urban Government
Focus upon current issues in urban and state government and politics and attempts to evaluate proposed solutions.

PS 210 **3 cr. 3 hr.**
Public Policy Analysis: Case Studies in American Politics
Covers four major divisions of public policy: health, education, labor, and welfare. The aim is to attain an understanding of how the American political system works through a study of the policy that has come out of that system.

PS 220 **3 cr. 3 hr.**

Constitutional Law and the Supreme Court
Treats the Constitution as a living document, tracing its development through historic Supreme Court decisions.

PS 250 **6 cr. 12 hr.**
Legal Internship
Internships are available in several regional law offices for those persons interested in para-legal work. These internships prepare students for positions in law offices, public administration, and other human service work. Credit is either 6 or 12 semester hours depending upon arrangements with the Social Sciences Department.

PS 320 **3 cr. 3 hr.**
Contemporary International Relations
A study of critical problems confronting the present international system. The "Cold War," armed conflict, internal violence, as well as prospects for the resolution of conflict are explored.

PS 350 **3 cr. 3 hr.**
Political Systems of the Modern World
A comparative analysis of modern national governments such as the Soviet Union, France, Germany, and Great Britain. Importance of the world's political heritage and the implications for the emerging nations of liberal democracy, communism, and dictatorship.

PS 360 **3 cr. 3 hr.**
Civil Rights and Civil Liberties in the United States
Conceptual perspectives of civil rights and civil liberties, freedom of expression and the problem of loyalty and security, equality, the civil rights movement, criminal justice procedures, and the politics of civil rights and liberties.

PS 370 **3 cr. 3 hr.**
Introduction to the Legal Process
An introduction to the American legal system: how courts and lawyers function, how cases are decided, and the means by which courts interpret legislation. Open to any student, but recommended for those interested in the legal internship program.

PS 494
Internships in Political Science
Off-campus opportunities, carrying appropriate academic credit, are available in local, state, and federal government offices and with political campaigns. Open to students who have the permission of the department. Credit and hours by special arrangement.

PS 490 **3 cr.**
Independent Study in Political Science
Open to students who have the permission of the supervising instructor and the department. Course of study, meetings, and credit by arrangement.

PS 493 **3 cr. 3 hr.**
Topics in Political Science
Courses having a more narrow focus or those taught on an irregular basis may be offered. New courses may be taught on an experimental basis under this title.

Psychology

Coordinator:
Mable Sgan

Professors:
Alan Bernstein
John Dufault
E. Arthur Garvin
Paul Girling
Mary Ann Hanley
Anita Hotchkiss
Donald Isaac
Mabel Sgan

Assoc. Professors:
G. Jefferson Breen
Carol Gay
Richard Spencer

Asst. Professors:
Peter Hogan
Allan Kimmel
Richard Kruse
Donna Lee McCabe
Beverly Roder

The degrees of Bachelor of Arts and Bachelor of Science in Psychology require a minimum of thirty-seven semester hours of course work in Psychology, beyond the course in General Psychology.

Note: The Bachelor of Arts degree requires foreign language proficiency at the second year college level.

The program is divided into two groups of courses with special requirements, integrative or pre-professional courses.

Liability insurance is required of all students enrolled in field-based or clinical courses, courses with practicum experiences, or courses otherwise deemed by the respective academic programs.

Requirements for the Psychology Major:

GROUP I:
All courses required
PY 110 General Psychology (not counted toward major)

PY 211 Intro. to Research Methods
PY 212 Psychological Statistics
PY 441 Experimental Psychology
PY 448 History and Systems in Psychology

GROUP II:
At least one course required from each area.
Area 1: Developmental
PY 221 Child Psychology
PY 223 Adolescent Psychology
PY 224 Adult Development
PY 225 Psychology of Women
PY 226 Gerontology
PY 228 Psychology of Human Sexuality
PY 232 Death and Dying

Area 2: Adaptive
PY 216 The Psychology of Speech and Communication
PY 230 Psychology of Personality
PY 240 Psychology of Captivity
PY 265 Social Psychology
PY 335 Abnormal Psychology
PY 355 Group Dynamics
PY 362 Work and the Individual
PY 357 Small Group Leadership

Area 3: Basic Processes
PY 342 Physiological Psychology
PY 343 Perception
PY 350 Psychology of Learning
PY 353 Motivation

Area 4: Applied Studies
PY 215 Introduction to Speech Pathology
PY 345 Psychological Testing
PY 361 Organizational Psychology
PY 363 Industrial Psychology: Human Factors
PY 364 Performance Evaluation and Development
PY 371 Learning Theory and Its Application
PY 377 Principles of Guidance

The remainder of the thirty-seven credits should be taken among the above areas or from the following integrative or pre-professional courses. An integrative or pre-professional course is recommended.

Integrative or Pre-Professional Courses

PY 422
Advanced Child Psychology
PY 480
General Psychology Teaching Practicum
PY 481, PY 482
Practicum in Developmental Psychology
PY 483, PY 484
Practicum in Experimental Psychology
PY 490
Independent Study
PY 493
Topics in Psychology
PY 494, 495, 496 Internship in Psychology

Concentrations/Specializations/Electives
Students may concentrate or specialize in certain areas, such as Developmental Psychology, Industrial-Organizational Psychology, Social Psychology, Social Psychology, etc. Course options should be selected in consultation with the student's advisor. See "A Note on Service Courses" and "Planning Course Work" in the Psychology Student Handbook for guidelines.

Concentration in Industrial and Organizational Psychology
The Industrial and Organizational Psychology Concentration is designed to prepare students entering a wide range of occupations in business and industry. It is particularly appropriate for those intending careers in personnel or human resource functions. The concentration is available to any student majoring or minoring in psychology.

The Concentration requires students to take 12 semester hours of course work from the courses listed below, and others when they are approved.

PY 361 Organizational Psychology
PY 362 Work and the Individual
PY 363 Industrial Psychology: Human Factors
PY 364 Performance Evaluation and Development
PY 365 Personnell Psychology
PY 493 Topics in Psychology (where applicable)

Internships in Industrial and Organizational settings are available and strongly recommended for students taking this concentration.

Requirements for A Minor in Psychology The minor in Psychology requires a minimum of 18 semester hours of course work in the area, beyond the course General Psychology.

The Psychology minor is designed to enable the student (a) to understand and evaluate psychological research and literature; (b) to choose courses which complement and relate to the major field of study; and (c) to explore a particular interest in psychology in some depth. Accordingly, the following course organization is required:

Group I All courses required PY 110 General Psychology (prerequisite; not counted towards minor) PY 211 Introduction to Research Methods PY 212 Psychological Statistics

Group II At least one course is to be taken from EACH of any THREE of the four areas described under the major (Adaptive, Applied Studies, Basic Processes, and Developmental). The remaining required course may be selected from either the integrative courses or any one of the above mentioned areas.

*Asterisk indicates that the course is offered infrequently.

PY 110 **3 cr. 3 hr.**
General Psychology
Introduces the student to the contemporary discipline of the science of human behavior and mental processes. Topics for investigation include the scientific method, biological bases of behavior, maturation, motivation, emotions, learning, personality and adjustment. The course is prerequisite for all other courses in Psychology.

PY 211 **3 cr. 3 hr.**
Introduction to Research Methods
The emphasis in this course is on research design, including consideration of sampling procedures, questionnaire design, methods of observation and reporting.
Prerequisite: PY 110

PY 212 **3 cr. 3 hr.**
Psychological Statistics
This is an introduction to applied statistics, descriptive statistics, and basic inferential statistics up to and including analysis of variance.
Prerequisite: PY 110 and PY 211

PY 215 **3 cr. 3 hr.**
Introduction to Speech Pathology
This course provides an orientation to speech pathology by identification and referral procedures for primary speech problems, examination and observation of speech therapy procedures. Clinical point of view is stressed.
Prerequisite: PY 110.

PY 216 **3 cr. 3 hr.**
The Psychology of Speech and Communication
This course provides information for judging speech behaviors of self and others. Concepts of speech, language and communication, healthy speaking and listening behaviors, non-verbal communication, animal communication, linguistic and psycholinguistic theory.
Prerequisite: PY 110.

PY 220 **3 cr. 3 hr.**
Human Growth and Development
This life-span course emphasizes a study of the physical, physiological, social, and psychological development of the individual from conception to old age.
Prerequisite: PY 110. (Cannot be used as credit toward the major.)

PY 221 **3 cr. 3 hr.**
Child Psychology
This course offers an introductory overview of the developing child from conception trhough preadolescence. Theories and research are used to lay the foundation for the study of the physical, cognitive, social and emotional development of the child. Also considered are such topics as attachment, moral development, language acquisition, and genetic and environmental influences on development.
Prerequisite: PY 110.

PY 223 **3 cr. 3 hr.**
Adolescent Psychology
Adolescence as a stage of development and as a cultural phenomenon is investigated. The influence of physical, cognitive and psychosocial factors on the adolescent's search for identity is examined. Emphasis is on an interdisciplinary approach that draws on relevant theories and research from a wide range of fields.
Prerequisite: PY 110.

PY 224 **3 cr. 3 hr.**
Adult Development
This course introduces the student to theories and research for the periods of young and middleadulthood. Physical, mental and personality processes are covered, as well as issues and problems of research in adult development. Application of this knowledge to adults in their relationships and in their work settings are stressed.
Prerequisite: PY 110.

PY 225 **3 cr. 3 hr.**
Psychology of Women
Objectives of this course involve an increased awareness of the psychological development of women and of the dimensions of self and personhood in relation to society; the examination and analysis of issues relative to current debate concerning the status of women.
Prerequisite: PY 110.

PY 226 **3 cr. 3 hr.**
Gerontology: The Psychology of Growing Old
This course introduces the student to key issues and problems of aging persons as they approach thier final phase of development. A guiding theme is the potential for living full lives in old age. Topics for investigation include intelligence and memory, personality differences, altered life styles reactions to streess and loss including the personal loss of death. Focus is on integrating theory, current research and personal experience. Emphasis is on the normal aging process.
Prerequisite: PY 110.

PY 228 **3 cr. 3 hr.**
Psychology of Human Sexuality
This course includes a study of the relationships among the various aspects of sexuality, including relationships, social norms, and cross-cultural variations in sexual behavior.
Prerequisite: PY 110.

PY 230 **3 cr. 3 hr.**
Psychology of Personality
Dynamic factors in personality formation are studied through some of the leading theoretical positions on personality development.
Prerequisite: PY 110.

PY 232 **3 cr. 3 hr.**
Psychology of Death and Dying
Through lectures, readings, discussions, and media, students explore psychological theory, research, and personal feelings concerning the dying process, suicide, grief, sudden death, and dying as it influences persons at different developmental stages.
Prerequisite: PY 110.

PY 240 **3 cr. 3 hr.**
Psychology of Captivity
This course deals with the effects of captivity on both the captive and the captor. Materials include films, tapes, interviews, first-person accounts, systematic studies of experiences, and the long-term consequences on persons involved and on their children.
Prerequisite: PY 110.

PY 265 **3 cr. 3 hr.**
Social Psychology
This course provides an introduction to the study of human social behavior. Representative topics include attitudes and their formation, aggression, prosocial behavior, conformity, and interpersonal attraction, as well as group dynamics, structure, and leadership. The application of social-psychological research to contemporary social problems also will be considered.
Prerequisite: PY 110.

PY 275 **3 cr. 3 hr.**
Tests and Measurements
This is a study of the basic statistical concepts and techniques of measurement, with application to teacher-made tests and standardized tests used in education and psychology.
Prerequisite: PY 110.

PY 335 **3 cr. 3 hr.**
Abnormal Psychology
Normal, neurotic, and psychotic behavior and methods of psychotherapy are reviewed. Emphasized are techniques for maintaining optimal psychological health.
Prerequisite: PY 110.

PY 342 **3 cr. 3 hr.**
Physiological Psychology
This course examines the relationship between brain, mind and behavior. Topics include learning, motivation, emotion, motor activity, perception, and mental illnesses.
Prerequisite: PY 110.

PY 343 **3 cr. 3 hr.**
Perception
Principles related to a person's awareness of his world are studied. Topics to be considered are psychophysics, the relationship between motivation and perception, the sensory bases of perception and localization in space.
Prerequisite: PY 110.

PY 345 **3 cr. 3 hr.**
Psychological Testing
This course is designed to give students a broad understanding of the theory and use of psychological testing. Methods of test evaluation, analysis, and interpretation are presented. Standardized testing instruments used to measure human cognitive and affective factors are explored and their purposes reviewed.
Prerequisite: PY 110.

PY 350 **3 cr. 3 hr.**
Psychology of Learning
This course focuses on principles and theories of learning, classical conditioning, operant conditioning, verbal learning, acquisition of motor skills.
Prerequisite: PY 110.

PY 353 **3 cr. 3 hr.**
Motivation
Characteristics of motivated behavior, explanation of sources of motives, and application of theories to current research and interpersonal skills are studied in this course. Emphasis is on the biological, learned, and cognitive components of motivation. Topics include internal and external motives, the relationship of stress and motivation, the place of physiological processes in motivation, issues in motivation of others, motivation for aggressive/passive behaviors, and success/failure motivation.
Prerequisites: PY 110.

PY 355 **3 cr. 3 hr.**
Group Dynamics
The nature and dynamics of interpersonal relationships are revealed in typical group settings such as classrooms, workshop seminars, and other discussion-oriented groups. Emphasis is on both content and process as demonstrated in a laboratory learning environment.
Prerequisite: PY 110.

PY 357 **3 cr. 3 hr.**
Small Group Leadership
This course is designed to equip students to plan and conduct meetings requiring the coordination of effort of small groups of people. Participants will study and practice basic leadership skills applicable to a variety of small group settings. They will develop and demonstrate these skills in the context of small group participation in class and as leaders of extra-class groups.
Prerequisite: PY 110.

PY 361 **3 cr. 3 hr.**
Organizational Psychology
This course examines organizational influences on motivation and satisfaction of the workforce. Methods of surveying organizational climate are introduced, and a variety of intervention methods are evaluated. Organizational experience in Japan, Western Europe and the United States will be analyzed and compared.
Prerequisite: PY 110.

PY 362 **3 cr. 3 hr.**
Work and the Individual
This course considers the ways in which individuals meet their needs for growth and the development while the organization meets its needs for worker productivity. How the organization's needs affect workers and how workers react to these pressures are subjects studied. Topics include work as a basic human need, relationships with co-workers, interpersonal skills, uses of power influence, leading and motivating others meeting personal needs/job satisfaction, adaptation to change, problems in adaptation (alchohol, drugs, interpersonal, lack of competence, etc.), stress management, career development.
Prerequisite: PY 110.

PY 363 **3 cr. 3 hr.**
Industrial Psychology: Human Factors
Students develop the ability to fit the demands of people and work together. They study the "human factors" which affect design considerations. Competence is developed in tailoring work conditions and equipment to facilitate human performance and in identifying the skills required by the job.
Prerequisite: PY 110.

PY 364 **3 cr. 3 hr.**
Performance Evaluation and Development
The definition, measurement, and development of performance in complex work roles are analyzed. An essential ingredient of the course are participative workshops aimed at developing the skills of behavior observation, performance coaching, and training.
Prerequisite: PY 110.

PY 365 **3 cr. 3 hr.**
Personnel Psychology
This course will provide a treatment of the major issues in personnel psychology and will emphasize the psychological aspects of personnel systems. The focus of the course will be on the psychological assessment of potential and current employees as a means for "fitting" workers into jobs; the employment discrimination issues that may emerge in the work setting; and the use and interpretation of descriptive and inferential statistics in personnel decision making.
Prerequisite: PY 110.

PY 371 **3 cr. 3 hr.**
Learning Theory and Its Applications
This course focuses on the principles and theories of learning, as derived by both the laboratory psychologist and the educational researcher, as applied to various social settings: the classroom, the family, etc.
Prerequisite: PY 110.

***PY 373** **3 cr. 3 hr.**
Psycho-Social Problems of Urban Children
The experience of the inner-city child is studied in relation to housing, schools, and teachers; emergence of the "alternative school" and other attempts to help children. Students participate in a two-hour weekly seminar and work for at least five hours in the community.
Prerequisite: PY 110.

PY 377 **3 cr. 3 hr.**
Principles of Guidance
This is an introductory course for students interested in developing their skills in helping relationships in a one-to-one relationship and or in a group setting.
Prerequisite: PY 110.

PY 422 **3 cr. 3hr.**
Advanced Child Psychology
This course provides an expansion and continuation of the major topics in child psychology. Opportunities for individual projects and experiences with children will be provided.
Prerequisite: PY 221.

PY 441 **4 cr. 4 hr.**
Experimental Psychology
This course is an analysis and study of the scientific method, experimental designs, and laboratory methods in behavioral science, emphasizing laboratory experiments and scientific communication of results. Students design, analyze and report on their own research. Computer data analysis is also covered.
Prerequisite: PY 211, 212, junior or senior standing in the major, permission of Instructor.

PY 448 **3 cr. 3 hr.**
History and Systems of Psychology
This advanced course provides a consideration of contemporary psychology as seen in its historical perspective. The development of psychological concepts and theories is traced from their antecedents in philosophy, and the physical sciences.
Prerequisite: Junior or Senior standing, 15 credits in psychology.

PY 480 **6 cr. 15 hr.**
General Psychology Teaching Practicum
Assistantship in the teaching of General Psychology. By appointment by staff only.

PY 481, 482 **6 cr. 15 hr.**
Practicum in Developmental Psychology
Experience in practical application of basic principles of human development. Students work with staff in areas of mutual interest. Preference given to students who have taken courses in the developmental area.
Prerequisite: permission of Instructor.

PY 483 **3 cr. 8 hr.**
PY 484 **6 cr. 15 hr.**
Practicum in Experimental Psychology
Students perform advanced and applied work in experimental psychology. Students work with staff in areas of mutual interest.
Prerequisite: Permission of Instructor.

PY 490 **3 cr. 3 hr.**
Independent Study
This experience is offered primarily to psychology students of Junior or Senior standing, and requires approval of the professor and of the Psychology Curriculum Committee. The student must petition the Psychology Curriculum Committee the semester prior to undertaking the independent study. Independent study may take the form of: special advanced reading programs; problem identification and research; assistantships; acquisition of professional skills. Under no circumstances will independent study be substituted for regularly scheduled courses. Independent study may be taken for from 1 to 6 semester hours.
Prerequisite: 3.0 cumulative average in the major.

PY 493 **3 cr. 3 hr.**
Topics in Psychology
Courses offered on an occasional, experimental basis, for supplementation and enrichment of program. More than one such course may be taken with permission.

PY 494 or 495 **3 cr. 9 hr, 6 cr. 18 hr.**
Internship in Psychology
Through an internship the student experiences the relationship between courses in psychology and their applications in the field. Work is carried on in settings approved by the department, and faculty member and an on-site supervisor. Internships are available in service agencies, business, and industry. Each intership would presuppose specific course background. Students are encouraged to discuss internship plans with their advisors early in their college experience. Interested students must contact the Psychology Curriculum Coordinator early in the fall semester of the year in which the internship is desired. Internships are offered only in the spring semester.
Prerequisite: 2.5 cumulative average overall and in the major; departmental approval.

PY 496 **12 cr. 36 hr.**
Internship in Psychology
Same description and prerequisites as for PY 494 and 495.

Russian

Professor:
John Burke

RU 100 **3 cr. 4 hr.**
Russian for Beginners I
Correct pronunciation, reading ability, and fundamentals of grammar and syntax. Russian gradually becomes the working classroom and laboratory language.

RU 110 **3 cr. 3 hr.**
Russian for Beginners II

RU 200 **3 cr. 3 hr.**
Intermediate Russian I
Remedial pronunciation, grammar review, conversation, and laboratory practice. Readings stress U.S.S.R. life, customs, and culture. Russian is the working language.
Prerequisite: Two years of high school Russian or RU 110 and/or Instructor's permission.

RU 210 **3 cr. 3 hr.**
Intermediate Russian II
Continuation of RU 200.

RU 340 **3 cr. 3 hr.**
Dostoevsky and Tolstoy (In English)
An in depth comparative study of the two giants of Russian XIX century literature. Contrasts in biography themes and styles. Lectures and readings in English. Standard length paper. Midterm and final examinations.

RU 360 **3 cr. 3 hr.**
Russian Literature in English Translation
A seminar on a specific topic from Russian literature (eg. Soviet Literature, the modern Russian novel). Lectures and readings in English. Emphasis on significant works in Russian and Soviet literature. Midterm and final examinations and a standard length paper. May be repeated for credit.

RU 370 **3 cr. 3 hr.**
Russian Culture and Soviet Life (In English)
An introduction to Russian life and culture as manifested in Russian geography, art, music, film and literature. National characteristics of the Russian people and their influence on Soviet institutions. Everyday life in the Soviet Union. Includes a significant audio-visual component.

RU 490
Independent Study in Russian
Open to students in the language with the permission of the supervising instructor and the Department Chairman. Meeting times and credit by arrangement.

RU 493 **3 cr. 3 hr.**
Topics in Russian
Courses having a more narrow focus or those taught on an irregular basis may be offered. New courses may be taught on an experimental basis under this title.

Sociology

Coordinator:
Patricia Macrides

Professors:
Harold Melvin

Assoc. Professor:
Patricia Macrides

Asst. Professors:
Augustine Aryee
Margot Kempers

Sociology is one of the disciplines which make up the Behavioral Sciences Department. A major field in itself leading to the B.A. or B.S. degree, Sociology is also a component of the Human Services and Psychology majors in the Behavioral Sciences.

Liability insurance is required of all students enrolled in field-based or clinical courses, courses with practicum experiences, or courses otherwise deemed by the respective academic programs.

The Major in Sociology:
The major requires 36 semester hours of course work in Sociology approved by the faculty. Each faculty member serves as advisor to students majoring in Sociology. In conference with the advisee, the advisor will help design a General Program of Studies in Sociology to meet the student's individual educational objectives and career goals. For the student who has more specialized interests, certain areas in Sociology might be chosen, such as Criminal Justice, Urban Sociology, Race and Ethnic Relations, Sociology of the Family, Medical Sociology, and Sociology of Religion. Each area would consist of sociology courses and supportive courses from other areas of the college curriculum. The core courses required of all Sociology majors are Introduction to Sociology (SO 110), Basic Skills of Social Research (SO 213), Social Theory (SO 216), and Cultural Anthropology (SO 225)

for a total of 12 semester hours. The remaining 24 semester hours must be selected from advanced courses of which at least 18 semester hours must be in Sociology and 6 semester hours may be in Psychology and/or Human Services (beyond introductory level). The General Program of Studies in Sociology and each of the specialized areas are designed for students interested in professional employment immediately upon graduation, for students who plan to continue on to graduate school, and for Community College graduates who wish to continue their education toward the baccalaureate. Some potential ares of specialization are described below.

Criminal Justice
This area provides preparation for students interested in law school or planning careers in areas such as law enforcement, corrections, probation, para-legal services, and consumer protection. Students interested in working with youths and/or adults in community-based agencies such as half-way houses, shelters for battered women, and neighborhood centers also would benefit by following this area. The course selections can be tailored to the individual and professional needs of students who are currently employed in Criminal Justice agencies.

Urban Sociology
This area is recommended for persons seeking entry level jobs or careers in small cities or metropolitan areas. It is especially useful for those who desire to work in urban social agencies, city planning departments, personnel offices, neighborhood centers and community development projects. This may also provide an excellent background for those who plan graduate study in urban affairs, law, social work, urban planning and business.

Race and Ethnic Relations
This area is recommended for persons who plan to work or live in a multiracial environment. It provides background for jobs or careers in metropolitan agencies, business settings, governmental institutions, race relations programs, and employment centers.

Sociology of the Family
This area is designed to prepare students for employment in such family-related agencies as Children's Aid and Family Service, crisis intervention centers, homes for battered women, and welfare departments. It is also designed to provide sociological insight into the student's family of orientation and, if applicable, family of procreation. It is thus vocationally oriented and a preparation for living. It provides background for students who wish to enter the field of social work or who wish to continue their education in social welfare on the graduatel level.

Medical Sociology
This area is for students planning careers associated with health care. It would benefit students interested in working with drug addicts, alcoholics, and in health agencies such as nursing homes, drug rehabilitation centers, detox centers, hospices, and homes for the elderly.

Sociology of Religion
This area is designed for students who plan to seek employment in religious institutions, either in bureaucratic headquarters or in local groups. Such occupations include the clergy: rabbis, priests, and ministers; religious orders; religious counselors; and religious educators. It is also designed for those who seek greater understanding of religious beliefs, practices, and organizations.

The Minor in Sociology
The minor in Sociology consists of 18 semester hours in Sociology including Introductory Sociology (SO 110). There is a core of nine semester hours including Introductory Sociology (SO 110), Basic Skills in Social Research (SO 213), and Social Theory (SO 216). The remaining nine semester hours may be selected in keeping with the student's career choice or special interest

*Asterisk indicates that the course is offered infrequently.

SO 110 **3 cr. 3 hr.**
Introduction to Sociology
This course examines the structure and process in human group behavior, with consideration of development, maintenance, and change variables.
Prerequisite for all other Socialogy courses.

SO 213 **3 cr. 3 hr.**
Basic Skills of Social Research
The purpose of this course is to develop skills in research concepts and techniques (e.g., interviewing, participant observation, questionnaire construction, etc.) related to sociological study and practice.

SO 214 **3 cr. 3 hr.**
Application of Social Research in the Work Setting
This course proposes to provide a deeper understanding of the basic techniques of social research. The application of these techniques to consumer behavior, clients, organizations, social agencies, and case studies is examined. Students are also exposed to the computer and its relevanceto problem-solving situations in such fields as law, business, medicine, and government service.

SO 216 **3 cr. 3 hr.**
Social Theory
Social philosophy precursors, sociological scientific theorists from Comte to Parsons, and contemporary schools of thought in Sociology are studied.

SO 225 **3 cr. 3 hr.**
Introduction to Cultural Anthropology
This course introduces students to varying cultures created by men and women in their struggle for survival. Attention is given to hunting and gathering, pastoral, horticultural, agricultural, and industrial societies. The Bushmen and the Pygmies are studied in depth as examples of hunting and gathering societies. The Yanomamo Indians are investigated as examples of a horticultural society, engaged in frequent warfare with neighboring tribes. Cultural change imposed by industrialization and technological revolution in primitive and modern societies is also analyzed. The intent is to make student knowledgeable about the development and variability of cultures, living styles, and values, and to ignite students' imaginations to tackle elusive questions of the capabilities, limits, and future of human societies.

SO 235 **3 cr. 3 hr.**
Sociology of Language
The effect of culture on language is studied. Also considered are such variables as age, sex, class, racial and ethnic background on the ways people speak and write.

SO 244 **3 cr. 3 hr.**
Urban Sociology I: Community Development
This course provides a survey of the origins and development of cities the anatomy of modern American cities, world urbanization, urban planning, and social change. The focus is primarily on American urban life, past and present.

SO 245 **3 cr. 3 hr.**
Urban Sociology II: Community Analysis
This course examines the community as a social system. The course includes field study involving observation and analysis of local communities.

SO 250 **3 cr. 3 hr.**
Race and Ethnic Relations
This course explores the origin and nature of racial and ethnic difference and examines how such difference directly and indirectly affects the lives of American people. The focus is on patterns of racial and ethnic oppression and responses to such oppression. Consideration is given to the political, economic, legal, and socio-cultural experiences of several minority groups in American society.

SO 251 **3 cr. 3 hr.**
Future Studies: Sociological Perspectives
Students examine various sociological techniques for projecting the future of societies, and develop an awareness of technological, demographic, environmental, and other significant variables that influence change in human societies.

SO 362 **3 cr. 3 hr.**
Sociology of Religion
The emphasis of this course is on structure and function of religious organization, beliefs, and practices. Current issues in American religion.

SO 363 **3 cr. 3 hr.**
Sociology of The Family
This course emphasizes institutional and family living are considered.

SO 372 **3 cr. 3 hr.**
Medical Sociology
In this course, students explore the effects of stratification on health status and health care; communication between physicians and patients of different socio-cultural backgrounds; formal organizational studies of health facilties such as hospitals, clinics, or doctors' offices; social factors and their relation to chronic illness; the sociology of mental illness. Also investigated are the relationship between doctors and nurses; the organization and utilization of health services; the comparative examination of health systems either within a society or in a cross-cultural perspective; and the perception of illness as deviant or aberrant behavior.

SO 375 **3 cr. 3 hr.**
Criminology
This course provides a survey of the field of criminology, including such topics as classical and contemporary theories of crime; criminal statistics; homicide, rape, assassination, and property crimes; white collar crimes and corporate deviance; capital punishment; police, courts, and corrections.

SO 376 **3 cr. 3 hr.**
Juvenile Delinquency
This course examines major sociological theories of delinquency including an analysis of empirical studies. Attention will also be given to the juvenile judicial system and proposed treatment programs.

SO 490 **3 cr.**
Independent Study
A program of study designed with the student to make possible in-depth learning in a specific topic for which no regular course is available. For Sociology majors only. May be taken no more than two times with permission of Faculty. An Independent Study may be taken for 1 to 6 s.h.

SO 493 **3 cr. 3 hr.**
Topics in Sociology
Courses offered on an occasional, experimental basis for supplementation and enrichment of program. With permission more than one such course may be taken.

SO 496 **6 cr. 15 hr.**
Internship in Sociology
Arranged in consultation with Faculty and carried out under auspices of an approved agency or program in the community, or a state or federal agency or office. This experience should be of such a nature as to develop skills in sociological practice, principles, and/or research.

SO 497 **12 cr. 30 hr.**
Internship in Sociology
See SO 496 for description and prerequisites.

Spanish

Asst. Professors:
Maria DeVelasco
Jeannette Scharf

The Minor in Spanish
The minor in Spanish will require a minimum of 15 semester hours. Students must take Intermediate Spanish I and II or be able to demonstrate proficiency at that level. Elementary Spanish will not count toward the minor. After demonstrating intermediate level competency, the student may take a combination of courses in Spanish literature, composition or culture which will yield the requisite 15 hours of credit. For those students starting Spanish above the intermediate level, SP 490 Independent Study in Spanish, may be repeated for credit.

SP 100 **3 cr. 3 hr.**
Spanish for Beginners I
Correct pronunciation, reading ability and fundamentals of grammar and syntax, The premise is to teach the student the four language skills of listening, speaking, reading and writing. Cultural topics are integrated with these skills. Spanish gradually becomes the working classroom language. Students with a year or more of high school Spanish should register for Spanish 200.

SP 110 **3 cr. 3 hr.**
Spanish for Beginners II
Continuation of SP 100 or permission of the instructor.

SP 200 **3 cr. 3 hr.**
Intermediate Spanish I
A discussion of advanced grammar points and readings dealing with Spanish life. Emphasis will be on developing conversational fluency. *Prerequisite: SP 100 or permission of instructor.*

SP 210 **3 cr. 3 hr.**
Intermediate Spanish II
Continuation of SP 200 or permission of the instructor.

SP 300 **3 cr. 3 hr.**
Hispanic Culture
This course is designed to provide students with a knowledge and understanding of the Hispanic world through a study of the

historical and cultural development of different countries with emphasis on contemporary problems and social customs of the Hispanic in the USA.
Prerequisite: SP 210 or permission of the Instructor.

SP 330 **3 cr. 3 hr.**
Hispanic Literature
Selected works reflecting the Hispanic heritage in contemporary Spanish and Latin American literature.
Prerequisite: SP 210 or permission of the Instructor.

SP 350 **3 cr. 3 hr.**
Spanish Conversation and Composition
This course is designed to teach skills that will increase the student's overall ability to read, speak and write the language. Students will be expected to write compositions on topics developed in class.
Prerequisite: SP 210 or permission of the Instructor.

SP 400 **3 cr. 3 hr.**
Practical Spanish for the Public Services Professional I
Spanish for people in public services, human services, nursing, medical technology, special education, with special emphasis upon the cultural and psychological characteristics of Spanish speaking peoples.

SP 410 **3 cr. 3 hr.**
Practical Spanish for the Public Services Professional II
Continuation of SP 400 or Instructor's permission.

***SP 488** **3 cr. 3 hr.**
Methods for Teaching Spanish in the Elementary School
Techniques and materials for use in elementary school.
Prerequisite: Minimum of 12 semester hours beyond beginner's level and permission of Instructor.

SP 490
Independent Study in Spanish
Open to students in the language with the permission of the supervising Instructor and the Department Chairman. Meeting times and credit by arrangement.

SP 493 **3 cr. 3 hr.**
Topics in Spanish
Courses having a more narrow focus or those taught on an irregular basis may be offered. New courses may be taught on an experimental basis under this title.

Special Education

Chairman:
Anne May

Professors:
Katherine Flynn
Rosemarie Giovino
Anne May
Michele Zide

Assoc. Professors:
Lawrence Gomes
Sandra Miller-Jacobs
Hattie Moreland
Donald Rapp

Asst. Professors:
Carla Borg
Elaine Francis

The Special Education Department at Fitchburg State College is the oldest and most comprehensive state program in the Commonwealth of Massachusetts. In this program, emphasis is given to content, application and the ability to use strategies and resources in working with children and adults who have special needs.

Fitchburg State College provides four major options within the Special Education curriculum. Programs for Teacher of Children with Moderate Special Needs (N-9) and (5-12), Teacher of Young Children with Special Needs (ages 3-7), Teacher of Children with Severe Special Needs (N-12), and Teacher of Special Needs: Vision are offered.

All special education candidates must satisfy the Constitution requirement of the Commonwealth of Massachusetts. See, "Common Graduation Requirements..."

Majors in Special Education
I. Teacher of Children with Moderate Special Needs (N-9) and (5-12)/Elementary (1-6)
A performance-based program, this undergraduate major prepares students to provide direct services to handicapped children and adults. This is a combined special education and elementary sequence of study

which includes concentration in the areas of mental retardation, behavioral disorders, and learning disabilities. This program offers dual certification as an elementary teacher and teacher of children with moderate special needs.

The Bachelor of Science in Special Education with specialization in Special Education for the teacher of children with Moderate Special Needs must include SE 210, 220, 252, SE 390, 365, 366, 384, 386, 387; PY 110, 221, 371, 275, 377; AR 280 or MU 480; MA 283, EN 290, PL 300, GE 100, MA 100 or 110, or higher and four electives in Special Education which are chosen from courses SE 230 through SE 490. All Special Education courses must be taken at Fitchburg State College. All requirements are subject to change to the extent required by state regulations governing certification of educational personnel. Certification in elementary and special education may be obtained upon completion of this program.

II.Teacher of Young Children with Special Needs (ages 3-7)
The Young Child with Special Needs Program is unique in that the department of Special Education and the Early Childhood component of the Education Department have combined resources to undertake a comprehensive program to prepare personnel to teach young children with handicaps.

Students are prepared with a firm foundation in early childhood growth and development concepts, as well as a thorough knowledge of Special Education. Through observation, course work, and student teaching, students are exposed to assessment and methods and materials appropriate for young children with special needs. Practicum experience is required in both a special needs classroom and in a conventional classroom setting. Certification as a Teacher of Young Children with Special Needs may be obtained upon completion of this program. Certification as an Early Childhood Teacher may be obtained upon completion of an eight week practicum in a regular classroom placement (K-3).

The Bachelor of Science in Education for the Teacher of Young Children with Special Needs must include ED 100, 210, 211, 220, 240, 270, 310, 311, 405; SE 200, 251, 350 (section II), 390; and 12 semester hours of student teaching (SE 388, ED 384 or ED 385). SE 210 is recommended for all students in Special Education. SE 340 is a suggested requirement.

III. Teacher of Children with Severe Special Needs (N-12)
The Teacher of Children with Severe Special Needs is a competency-based four-year teacher preparation program designed to provide students with the necessary skills to teach children and adults labeled as severely or profoundly handicapped. The program includes college classes and field experiences with school age and adult handicapped individuals and will develop skills necessary for direct service to the severely handicapped population.

Specific objectives of the program are to prepare teachers who are competent in criterion-referenced assessment, task analysis, curriculum selection and development, programming and behavior management. Graduates of the program will be able to help individuals with handicaps make significant behavioral gains to enable them to function at their potential in the community. Certification as Teacher of Children with Severe Special Needs may be obtained upon completion of this program.

The Bachelor of Science in Education for the Teacher of Children with Severe Special Needs must include PY 110, 220, 275, 371, BI 120, SE 210, 300, 340, 390, 410, ED 270, SE 364, the Integrated Program for the Severely Multiply-Handicapped, twelve semester hours of practicum (student teaching) and three electives in Special Education.

IV. Teacher of Special Needs: Vision (N-12)
A competency-based, four year undergraduate Special Education program is offered in teaching the visually impaired child. The preparatory experiences will develop the knowledge, competencies and attitudes necessary for direct service to visually impaired children who are in integrated programs (primarily resource room settings, or mainstream settings in public schools), or who are in substantially separate programs for the multiply handicapped. In addition, each student successfully completing the program will be elibigle for Massachusetts certification as Teacher of Children with Special Needs: Vision and as Elementary Teacher (1-6).

*Asterisk indicates that the course is offered infrequently.

SE 200 **3 cr. 3 hr.**
Nature and Needs of the Young Child with Special Needs
The basic handicapping conditions as they affect children from birth to seven years will be reviewed with a focus on educational programming. The rationale for early intervention, the importance of the child-environment interaction and current legislation affecting young children with special needs will be discussed. Observations of programs servicing young children with special needs will be made.
Prerequisite: Young Children With Special Needs Track, and others by consent of Instructor.

SE 210 **3 cr. 3 hr.**
Introduction to Individuals with Special Needs
An introductory course in Special Education focusing on the characteristics and needs of exceptional children and adults; the total special education delivery system; controversies and issues in the field; relevant state and federal legislation and court cases.

SE 220 **3 cr. 3 hr.**
Individuals with Moderate Special Needs
A concentrated course that focuses specifically on the areas of mental retardation, emotional disturbances and learning disabilities. Also, theoretical approaches for managing behavior will be emphasized. A 30-hour practicum is required.
Prerequisite: SE 210.

SE 230
Alternative Programs in Special Education
This course is designed to prepare students with the skill necessary to function in alternative programs for persons with special needs, from birth to adulthood.

1. Students will be able to identify alternative programs serving persons with special needs on a continuum and evolving in a cascade for services from birth through adulthood.

2. Students will be able to examine the organizational structure and identify the administrative design, funding sources, staffing patterns, agency collaboration, and community outreach of an alternative program.

3. Students will develop a case report on one client.

4. Students will identify components for being a client advocate.

5. Students will design a program with an agency under the supervision of an agency professional and a college supervisor.
Prerequisite: Integrated Program (SE 365, 366).

SE 240 **3 cr. 3 hr.**
Seminar in Special Education: Microcomputers
This course provides students with the knowledge and experience necessary to use microcomputers with individuals with special needs. Consideration is given to the functionality of hardware, software and peripherals available for use by individuals with special needs. Students examine commercially available software, word processing and LOGO in terms of its applicability to special needs populations and existing curriculum. A mini-practicum enables students to work with computers and children with special needs.
Prerequisite: SE 365, SE 364 or permission of instructor.

SE 245 **3 cr. 3 hr.**
Seminar in Special Education: Research in the Classroom
This course is designed to acquaint students with the principles and procedures of applied behavior analysis. Through the study of theory, and participation in field based experiences, students will be able to: make direct and daily measurements of children's behavior, record and chart data, make trend analyses, devise and use single subject research designs, and make decisions regarding the effectiveness of their instruction in the basic academic areas (reading writing, spelling, arithmetic and social skills).
Prerequisite: SE 350 or consent of the instructor.

***SE 250** **3 cr. 3 hr.**
Drugs and Schooling
A study of the history of drug use and abuse among school age children and adults. The course involves completing a research orientated learning package and implementing a learning contract designed to meet the students' personalized educational goals related to the topic of drugs and schooling. Topics discussed include preventative and treatment modalities implemented to effect young children, adolescents and adults who have concerns which involve the use of drugs.

SE 251 **3 cr. 3 hr.**
Identification and Diagnosis of Young Children with Learning Problems
Students will:

1. Analyze the learning process in terms of physiological, neurological, social and language development and demonstrate knowledge of atypical developmental patterns.

2. Select and administer evaluative measures in cognitive, perception, motor, language and academic areas and interpret the results.

3. Plan teaching processes for children with learning problems.

4. Write an assessment report and an IEP.
Prerequisite: Language and Speech Development. Field experience required. Spring semester.

SE 252 **3 cr. 3 hr.**
Teaching Children with Moderate Special Needs
This course covers the basic concepts and issues in assessing handicapped children and in analyzing what to teach. It provides pre-service teachers with a set of tools for observing and recording behavior of handicapped children and for measuring children's progress from day to day. The course explains the development of instructional objectives based on evaluative procedures and demonstrates various teaching and management approaches used with children with mild to moderate special needs. Students write lesson plans, design and make materials for use in a classroom setting, and develop and present in class a learning center. Finally, the course includes procedures for developing IEP's and the processes for implementation.
Prerequisites: SE 210, 220.

SE 260 **3 cr. 3 hr.**
Affective Developmental Strategies
Students study the affective domain variables as they relate to developmental stages of psychological growth, moral development, achievement motivation, and value clarification. Strategies designed to enhance affective growth within a basic skills curriculum are discussed. Each student designs a unit of study within a basic curriculum subject area utilizing strategies to enhance the needs of a given population.

SE 300 **3 cr. 3 hr.**
Habilitation and Rehabilitation of the Special Child
An analysis of the adaptive problems of the handicapped as they affect and effect society.
Prerequisite: Integrated Program (SE 365, 366). Fall semester.

SE 310 **3 cr. 3 hr.**
Early Learning Experiences for Exceptional Children
This course emphasizes a developmental approach to working with young children with special needs. Students will compare and contrast various screening and assessment devices used for children ages 0-6 and will be able to use developmental check-lists to plan curriculum. Various infant and preschool programs for young children with special needs will be examined. The importance of play will be discussed (Practicum is required).

SE 330 **3 cr. 3 hr.**
Current Issues in Special Education
This course is designed to assist students in Special Education to gain a broad perspective on the aspects of controversy and change which are influencing the profession. In addition, with the inclusion of diverse and, in some cases, incongruent perspectives, the course is intended to stimulate critical thinking among prospective special educators. Various current issues effecting special needs children, their parents, teachers and the continually changing field of Special Education will be researched, examined, and discussed.
Prerequisite: SE 200, 210, SE 220

SE 340 **3 cr. 3 hr.**
Characteristics of Severely Multiply Handicapped
The course offers a review of various severe handicaps and their effects on independent functioning. Medical aspects of disabilities will be covered as well as interventions that may need to take place in emergencies. Classroom management techniques for the physically handicapped including positioning and handling and adaptive equipment will be addressed.
Prerequisites: SE 210, 200 (YCSN). Spring semester.

SE 350 **3 cr. 3 hr.**
Behavior Management in the Classroom
This course prepares students to implement a variety of behavior management techniques e.g., Time-Out, Contingency Contracting, and

Applied Behavior Analysis. Emphasis is on the development of a positive problem-solving approach to manage academic and social behaviors. Consideration is also given to developing an awareness of the teacher's behavior and its effect on the behavior of children.

SE 355 **3 cr. 3 hr.**
Behavior Managment in the Classroom YCSN
The course is designed for students seeking certification as a Teacher of Young Children with Special Needs. Emphasis is placed on setting limits and ways of recording behavioral changes. Specific behavior management techniques and strategies are examined with consideration given to both behavioral and psycho-dynamic strategies. Students analyze current literature on behavior management.

***SE 360** **3 cr. 3 hr.**
Seminar in Special Education I and II
Fall: Tactile and Motor Implications in Learning
A study of the major theories of motor learning in exceptional children. Assessment procedures and teaching methods are emphasized throughout. Students will actively participate in developing and demonstrating activities.
Prerequisites: SE 200, 210, and SE 220.

SE 364 **15 cr.**
Integrated Program for Severely Multiply Handicapped
This course will cover assessment, program development and implementation of program in the major curriculum areas (communication, language, motor, socialization, prevocation, A.D.L., sensorimotor, cognition, community living skills) for individuals with severe special needs. These topics will be covered in seminars during the first week of classes, and in bi-weekly seminars for the remainder of the semester, students participate in a morning practicum daily for 10 weeks and an all-day practicum for the remainder of the semester.
Prerequisites: SE 210, 340, 410 PY 110, 220. Spring Semester.

SE 365 **9 cr.**
Integrated Professional Program
The Integrated Professional Program in the Department of Special Education is a program that moves the preparation of special educators from a college-based program to elementary schools in the community. In this setting, students have theoretical, observational, and participatory experiences. When a concept or technique is introduced academically, the students have the opportunity to observe a demonstration in the classroom and to engage in a teaching practice.

The College faculty provide guidance, immediate feedback and further demonstrations. The cooperating practitioner also participates in this experience with the student. The students raise questions based on their academic and participatory experiences and share ideas, problems and learning with other professionals.

This program prepares teachers to meet the educational needs of students who manifest learning behavior problems in the regular elementary classroom environment.
Content includes:
Reading/Language Arts/Learning Problems
Curriculum and Methodology
(a) Math
(b) Science
(c) Social Studies

Behavior Management
The college student spends three weeks, 6 hours a day, in an orientation program on campus for course content, and 6 weeks, 3-4 hours per day on site at an elementary school for prepracticum experiences.
Prerequisites: PY 110, 221, 275, 371; SE 210, 220, 252, 390; MA 283; AR 280, MU 480 and the consent of the faculty of the department.

Eligibility

Students must have a 2.5 cumulative average in Special Education and prerequisite courses.

***SE 366** **6 cr.**
Practicum Level I
The College student spends 6 weeks at the same elementary school as above in an elementary teaching experience on a full-day basis. SE 365 and SE 366 are taken during the same semester.

SE 370 **3 cr. 3 hr.**
Eye and Vision
This course provides the special educator with knowledge concerning anatomy and physiology of the eye, visual development, refraction and interpretation of eye reports, eye disorders ranging from mild to total vision loss, and educational implications. Other topics covered are: low vision aids, mobility devices, self-help skills, and vision screening.
Prerequisites: SE 210. Fall semester.

SE 380 **3 cr. 3 hr.**
Secondary Programs for Adolescents (14-22) with Special Needs
The college student will attend lectures, complete readings, and participate in discussions related to academic programming for adolescents between the ages of 14 to 22 in a variety of educational settings. Each student will complete a twenty-hour field experience teaching academics in a secondary school.
Prerequisites: SE 210, 220. Fall semester.

SE 384/385 **6 cr. each**
Practicum I/II-Teacher of Children with Severe Special Needs
Students will participate in an sixteen-week full day practicum in a classroom for individuals with severe special needs. Responsibilities include assessment, program development, writing and implementation of instructional programs, data collection as well as staff training and self evaluation.
Prerequisite: Integrated Program for Severely and Multiply Handicapped. Fall semester.

SE 386 **6 cr.**
Practicum Level II
One of the significant aspects of the curriculum is the practicum. All students are assigned to an elementary classroom for eight weeks. The cooperating practitioners selected for this program have been carefully screened in respect to certification requirements, their ability as teachers, and their identification with the program. Each student assumes complete classroom responsibility guided by the cooperating practitioner and the college supervisor. Students receive certification as elementary teachers (1-6).

SE 387 **6 cr.**
Practicum Level III
All students are assigned to a resource room for eight weeks. The cooperating practitioners selected for this program have been carefully screened in respect to certification requirements, their ability as teachers, and their identification with the program. Each student assumes complete responsibility guided by the cooperating practitioner and the college supervisor. Students receive certification as Teachers of Children with Moderate Special Needs (N-9) (5-12). Students seeking certification (5-12) must be assigned to a secondary level resource room and must have completed SE 380 and PY 223 prior to Practicum Level III.

SE 388 **6 cr.**
Practicum (YCSN)
Practicum consists of at least one hundred and eighty (180) clock hours of supervised teaching experience which is primarily with young children (ages 3-7) identified as being in need of special education services. Under the supervision of college faculty and cooperating practitioners students will become increasingly involved in the total classroom program. During the final weeks of the practicum they will assume full responsibilty as head teacher for the operation of the classroom to which they are assigned. Students receive certification as Teacher of Young Children with Special Needs (3-7).

SE 390 **3 cr. 3 hr.**
Language Development and Speech (Mod Sp. Needs)
This section addresses the normal development of speech, language and hearing and disorders associated with each of these areas of communication. Students will demonstrate a knowledge of articulation problems and types of hearing losses and their effects on academic learning. In the area of language disorders students will demonstrate an understanding of delayed language and learning disabilities as they relate to reading, math and written language. Students will evaluate speech and language skills of school age children utilizing selected instruments, interpret the results, plan teaching strategies and work with a child. Field experience required.
Prerequisites: PY 221, SE 220. Fall semester.

SE 395 **3 cr. 3 hr.**
Language Development and Speech YCSN
In this course students will:

(a) Explain normal development of auditory receptive language and auditory expressive language from birth to 7 years;

(b) Analyze linguistic development, phonology, morphology, and syntax, semantics, pragmatics;

(c) Compare and contrast various theories of language acquisition;

(d) Select and administer instruments to diagnose receptive and expressive deficits, interpret the results, and plan teaching strategies.

Field based experience required.
Prerequisite: SE 200, ED 100 and ED 211. YCSN majors, others by consent of Instructor. Spring semester.

SE 400 **3 cr. 3 hr.**
Program Development for Children with Learning Problems
In this course students will:

(a) Explain models of language behavior and determine dysfunctioning in factors associated with language development;

(b) Critically evaluate the research and literature relating to the development of linguistic and perceptual-motor performance;

(c) Interpret, compare, and contrast the theories regarding diagnosis and treatment of learning disorders;

(d) Select and administer evaluative measures in the cognitive, perceptual and psychomotor domains;

(e) Plan and write education programs for individual children with moderate to severe handicaps based on assessment data;

(f) Make application of the principles of diagnosis and remediation and the theoretical formulations having relevance for learning disorders in situations dealing with children in the public schools.
Prerequisite: The Integrated Professional Program (SE 365, 366). Field based experience required.

SE 405 **3 cr. 3 hr.**
Issues in Mainstreaming
Course is designed for Elementary education majors. The issues will be applied to the public school system as they relate to the special needs child. Topics will include litigation, PL 94-142, mainstreaming, teacher expectations, accountability, the educational plan, reporting procedures, peer tutoring, human resources, and program models. Elem. majors only.

SE 410 **3 cr. 3 hr.**
Teaching Strategies for the Severely Handicapped
This course offers an opportunity, through course work and a weekly practicum, for students to interact with a severely handicapped individual and develop an assessment, educational plan and instructional program for that individual. In addition, the course will outline strategies and techniques for changing behavior of children at this level, and will offer suggestions for meeting the needs of these individuals in the total school program. An overview of services now available for the severely handicapped will also be provided.
Prerequisites: SE 210, 200, (YSCN). Fall semester

SE 420 **3 cr. 3 hr.**
Strategies for Teaching the Visually Impaired
This course covers the foundations of education for the blind and visually impaired. It deals with specific instructional techniques, reading and other language arts, mathementics, science, and social studies through the use of tactual, auditory, and visual arts.
Prerequisites: SE 210, SE 370, SE 471, SE 472, Fall Semester.

SE 421 **3 cr. 3 hr.**
Curriculum Development and Adaptation for the Visually Impaired
This course covers learning and behavioral characteristics of children with visual disabilities. Curriculum adaptations and specific curriculum areas will be covered: i.e., activities of daily living, pre-cane skills, typing, listening, communication skills, etc. Various assessment procedures and environmemental management and control will be covered.
Prerequisites: SE 210, SE 370, SE 471, Spring Semester

SE 430 **3 cr. 3 hr.**
Children and Adolescents in Conflict
Examined are existing models of childhood and youth disturbance as they apply to educational programming for students in conflict. Screening, identification and diagnostic strategies appropriate to each model are studied. Classroom applications supporting a given conceptual model and its prescribed approaches are explored. Field visits and observations in special education settings provide the college student with an opportunity to view teaching strategies related to a given model and to practice selected assessment and observation skills.

SE 460 **3 cr. 3 hr.**
Problems in Language Arts for Special Education
Students identify, develop, use resources related to classroom problems in language areas. Stages of development and deviations of exceptional children are emphasized

SE 468 **3 cr. 3 hr.**
Group Processes and Counseling
This course is designed for special education majors and provides an overview of the counseling process with handicapped students and adults, including introduction to group processes applied to various disabilities.

Students identify specific adjustment problems related to handicapping condition and the origin of attitudes towards the handicapped. Students will explore the psychologial and social implications of handicaps and the significance of self-concept.
Prerequisite: SE 210, 220, or consent of instructor.

***SE 469** **3 cr. 3 hr.**
Community Resources for the Exceptional Child
Identification of agencies, practices and personnel, development of models, simulation of roles and production of a guide.

***SE 470** **3 cr. 3 hr.**
Contemporary Issues in Multicultural/Bilingual Education
This course will focus on the values, life styles and customs of culturally diverse and linguistically different children. Major emphasis will be placed on how the above factors impact on Special Education in a monolingual American learning environment. Black American, Hispanic American and Indo-Chinese cultures will be primary groups for the study of various cultures.
Prerequisites: SE 210. Spring semester.

SE 471 **3 cr. 3 hr.**
Reading and Writing Braille and Mathematics
The student will develop skill in reading Standard Literary Braille, as well as the teaching of Braille from reading readiness to adult level. The student will develop skill in writing Standard Literary Braille, using the Perkins Brailler and a slate and stylus. This course will include a review of the contractions in Standard English Braille. Major concentration will be devoted to use of the abacus for the four basic math processes, fractions, and decimals; and Nemeth Code for Braille mathematics. The student will also be responsible for producing a tactual teaching aid for mathematics. Other calculating devices will be explored, i.e. computer and calculator. Fall Semester.
Prerequisite: SE210. This course is open to a limited number of students.

SE 473 **3 cr. 3 hr.**
Methods for Teaching Linguistic Minority/Special Needs Students
This methods course covers various teaching models, identification and analysis of learning styles, skills and needs of bilingual special education students. Students examine, evaluate selected curricula, design programs and materials for students with learning problems.
Prerequisites: SE 210, 220, 252. Fall semester.

SE 490 **3 cr.**
Independent Study
Review, development, and synthesizing of a problem in special education. Open to juniors and seniors with permission of Instructor.

SE 493 **3 cr. 3 hr.**
Topics in Special Education
This advanced course provides an opportunity for students to identify, review the literature and discuss some of the critical issues affecting the field of special education. The topic is selected by the instructor. This format serves as a vehicle for curriculum experimentation and/or enrichment.

Speech

Assoc. Professor: Robert Welch
Asst. Professor: Eugene Casassa

The Theatre Minor requires a minimum of 15 semester hours, including Introduction to Theatre (SH 415), and at least 2 of the following courses:

SH 425 Stagecraft and Theatre Production;
SH 430 Mime and Movement in Theatre or PE 405 Art of Dance;
SH 435 Acting or PE 413 Making Dances;
SH 440 Directing the Play;
and at least 1 of the following courses:
EN 300 World Drama
EN 302 Modern Drama
EN 402 Shakespeare's Drama
or
EN 403 Shakespeare's Thought

Three hours of a theatre internship may also count toward the minor.

SH 010 **1 cr. 1 hr.**
Speech Improvement
This is a remedial course. Students are assigned after diagnosis and recommendations of need for speech improvement with individual and group therapy.

SH 100 **3 cr. 3 hr.**
Introduction to Speech Communication
Students are introduced to the theory and practice of interpersonal and public communication. Topics include: communication theory, self-concept, perception, language, listening, non-verbal communication, and public speaking. Meets General Education speech requirement.

SH 110 **3 cr. 3 hr.**
Argumentation and Debate
Projects are undertaken in argumentation and debate with emphasis on analysis, research, evidence, strategies, briefing, refutation, and the delivery of debates on representative questions. Meets General Education speech requirement.

SH 120 **3 cr. 3 hr.**
Business and Career Communication
Theory and methods of communication are applied to business and career problems. Emphasis is placed on skills especially important to students planning on working for and/or within an organization, such as resume writing, interviewing, and group conference techniques. Meets General Education speech requirement.

SH 130 **3 cr. 3 hr.**
Effective Speaking for the Electronic Media
This course focuses on a variety of speaking experiences encountered by those who plan to use electronic media in their occupation. The course should interest students who anticipate speaking roles in industry-made productions as well as those who aspire to careers as professional broadcasters. Meets General Education speech requirement for those majoring in Communications Media.

SH 140 **3 cr. 3 hr.**
Discussion and Conference Techniques
This course explores the fundamentals of group discussion in private and public settings. Emphasis is placed on group structure, leadership, and interpersonal relationships, and includes extensive practice in varied group situations. Meets General Education speech requirement.

SH 160 **3 cr. 3 hr.**
Public Speaking
A course of value for all students regardless of major, public speaking is especially useful to students with an interest in public affairs and a desire to influence the decisions of others. The course concentrates on the development of skills and strategies employed in the preparation and presentation of public address. Meets General Education speech requirement.

SH 210 **1 cr. 1 hr.**
Intercollegiate Debate and Forensics
Opportunities are afforded for study and participation in debate and forensic speaking activities.

SH 240
Voice and Articulation
The elements of vocal production and presentation are examined, with special emphasis on the study of and application of phonetic theory. The course is designed for the student desiring improved voice and articulation quality, accuracy, and clarity. Meets General Education speech requirement.

SH 260 **3 cr. 3 hr.**
Persuasion
A study of the causes of listener belief and action gives special emphasis to the development of strategies to influence listener behavior. Students have the opportunity to devise persuasive campaigns on subjects of their choosing. Meets General Education speech requirement.

SH 415 **3 cr. 3 hr.**
Introduction to Theatre
An introductory course, surveying theatre: its history, its focuses, its practices and major practitioners (directors, actors, scenic designers), emphasizing historical and social contexts.

SH 280 **3 cr. 3 hr.**
Rhetorical Criticism
An exploration of approaches to the rhetorical criticism of significant speeches and speech movements, past and present, this course includes rhetorical, literary, historical, linguistic, and quantitative methods of criticism.

SH 415 **3 cr. 3 hr.**
Introduction to Theatre
An introductory course, surveyng theatre: its history, its focuses, its practices and major practitioners (directors, actors, scenic designers), emphasizing historical and social contexts.

SH 420 **3 cr. 3 hr.**

Children's Theatre

This is an introductory course in theatre for children, its principles and practices. It covers aspects of play production for juvenile audiences: script selection and evaluation, directing, acting, and staging techniques.

SH 425 **3 cr. 3 hr.**

Stagecraft and Theatre Production

In a laboratory situation, which is project oriented, the student will take one selected play from initial sketches through to the finished model and plans for production, including design, set building, costuming, lighting, and management.

SH 430 **3 cr. 3 hr.**

Mime and Movement Theatre

This workshop-oriented course utilizes the basic techniques of theatrical mime and movement with emphasis on developing each student's potential for effective physicalization on the stage.

SH 435 **3 cr. 3 hr.**

Acting

This course includes fundamentals of stage speech and movement, creative mime and improvisation. Plays are read amd analyzed. Systematic technique building and scene study are heavily emphasized.

SH 440 **3 cr. 3 hr.**

Directing the Play

A lecture/seminar/workshop in which the basic elements of style/blocking/organization/focus are shown and practiced.

SH 490 **3 cr.**

Independant study

Exceptional students excelling in scholarship may, upon approval of both department head and advising instuctor, undertake Independant Study.

SH 493 **3 cr. 3 hr.**

Topics in Speech

Courses having a more narrow focus or those taught on an irregular basis may be offered. New courses may be taught on an experimental basis under the title.

College Directory

Administration

If you have questions the following administrators have information on subject matter listed below:

The President
General interests of the College.

The Vice President for Academic Affairs
Academic services, faculty and academic professional staff.

The Undergraduate Dean
Curriculum, academic work of students.

The Director of Facilities
Space allocation, handicapped accessibility, all contruction, maintenance and repairs, security.

The Registrar
Academic records, transcripts.

The Vice President for Student Services
Financial Aid, scholarships, remunerative work, placement, counseling.

Office of the President

VINCENT J. MARA
President
BSEd Worcester State College
EdM Worcester State College,
PhD University of Connecticut. 1976

DANIEL S. FLYNN
Assistant to the President Development
AA Worcester Junior College
AB Assumption College. 1978

THOMAS COATES
Assistant to the President
BA Western Michigan College
JD New England College of Law. 1974

TERRANCE CARROLL
Assistant to the President
AB Northeastern University
MEd Fitchburg State College. 1974

JOHN J. GIARUSSO
Dirctor, Personnel and Affirmative Action
BS Worcster State College. 1987

ELIZABETH M. RODENHISER
Staff Assistant Administrative Services
Certificate, Salter Secretarial School. 1976

ROY HALL, III
Director, Management Information Systems Computer Center
BS Framingham State College. 1977

KERRY A. ANDERSON
Staff Assistant. 1985 Computer Center
BS Framingham State College
MBA Anna Maria College

PATRICIA CARROLL
Staff Assistant Computer Programmer — Computer Center
BS Worcester State College. 1980

RODNEY GAUDET
Staff Assistant Computer Center
BS Fitchburg State College. 1984

JANE LEWICKE
Staff Assistant/Programmer Analyst — Computer Center
BS Lowell Technological Institute. 1984

LAURA GURLEY-MOZIE
Staff Assistant/User-Services
BS Fitchburg State College. 1981

DENISE POPKO
Alumni Director
AS Greenfield Community College
BS Fitchburg State College. 1979

MICHAEL V. SHANLEY
Director of Information Services
BA Providence College. 1985

DENISE A. EHNSTROM
Alumni Programs Specialist
BA Fitchburg State College. 1986

Academic Affairs

OLIVER J. FORD, III
Vice President, Academic Affairs
BFT American Graduate School for International Management
MA Tulane University
PhD University of Connecticut. 1987

ELAINE GARDINER
Dean, Undergraduate
BA Washington College
MA Ohio University
PhD Ohio University. 1985

THERESE BUSHNER
Staff Associate, Academic Affairs
BSEd Duquesne University
MA Bowling Green State University.
PhD University of Wisconsin - Milwaukee. 1985

FRANZ A. NOWOTNY
Dean, Graduate & Continuing Education
MA University of Vienna, Austria
PhD University of Florida. 1983

RICHARD F. CONDON
Director, Student Records/Registrar
BS Ed Fitchburg State College
MEd Fitchburg State College. 1959

RUDOLPH JONES
Director of Admissions
BA University of Massachusetts
MEd University of Massachusetts. 1987

ANDERSON, CHARLES
Staff Assistant, Graduate and
Continuing Education
B.A. Princeton University
M.S. George Washington University. 1986

ALVIN T. RILEY, JR.
Director, AID
BS Bently College
MRE Gordon-Conwell Theological Seminary
MDiv The Interdenominational Theological
Center and Turner Theological Seminary
MA Atlanta University. 1987

WILSON, ROBERT
Staff Assistant, Image Systems
BS University of Nebraska. 1986

JOHN J. MAZEIKA
Director of Institutional Research
BS College of the Holy Cross
MEd Boston College. 1966

CATHERINE CANNEY
Coordinator Special Programs
BS Bridgewater State College. 1984

JAMES ROGER
Staff Assistant
Journeyman. 1984

HOWARD J. RIVERS
Staff Assistant, Image Systems
Certificates: Main Photographic School,
Nikon School Seminar. 1977

MARY CHARTRAND
School Nurse, McKay Campus School
RN Burbank Hospital. 1974

DAVID S. PROTHERO
Staff Associate
Manager/Designer,
FSC Press
Associate Degree in Specialized Technology
Art Institute of Pittsburgh. 1985

MILDRED VINSKEY
Acting Associate Dean/Principal McKay
Campus School
BS Worcester State College
MEd University of Massachusetts
EdD University of Massachusetts. 1967

Joseph A. Angelini
Associate Director, Admissions
BA Providence College
MEd Boston College
CAGS Boston University. 1958

MARKE MILLER VICKERS
Staff Assistant, Admissions
BA Ohio Wesleyan University
MA University of Northern Colorado. 1976

CAROL A BOUNDY
Staff Assistant, Admissions
BA University of Massachusetts
MA Fitchburg State College. 1986

SCOTT J. GAUTHIER
Staff Assistant, Admissions
BS Franklin Pierce College. 1986

Student Affairs

LON S. VICKERS
Vice President, Student Affairs
BA University of New Mexico
MA University of No. Colorado
PhD University of No. Colorado. 1979

FREDICO J. TALLEY
Associate Dean of Students
AB Dickinson College
MA Bowling Green State University
PhD Ohio University. 1987

MARTHA EVERETT-SAVERY
Director of Financial Aid
BS St. Michael's College. 1981

ELIZABETH KRUCZEK
Director, Athletics
BS Boston University
MEd Worcester State College. 1966

RAOUL REBILLARD
Director, Campus Center
BS University of Maryland
MS So. Connecticut State
College. 1975

CARL JOHNSON
Staff Physican
BA University of Vermont
MD University of Florida. 1983

GAIL HINAND
Director, Counseling
BA Linfield College
MED Boston University
EdD Boston University. 1985

KATHLEEN MARTIN-ESTUS
Staff Associate, Coordinator of Health Services-Nurse Practitioner
Diploma St. Frances Hospital School of Nursing. 1982

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Associate Director, Campus Center
BA University of Massachusetts. 1976

JERRY FOSTER
Staff Assistant/Athletic Trainer
BS Northeastern. 1983

SHARON SARNO-BARBANEL
Staff Assistant/Counselor
BA University of Massachusetts
MS Suffolk University. 1985

EDWARD McDERMOTT
Staff Assistant, Financial Aid
BS Bryant College. 1986

SHEILA FOLEY
Staff Assistant, Residence Director
BA Westfield State College. 1986

REBECCA WOODS
Staff Residence Director
BS University of Maine at Orono

GLENN JUNCHNO
Staff Asst./Residence Director
BA The College of Saint Rose

GERALD SORGE
Assistant Director, Residence Life
BS State University Fredonia
MS University of New Hampshire. 1986

GRACE KELLY
Staff Asst./Residence Director
BA McGill University

CHRISTOPHER JACKSON
Residence Hall Director
AA Dean Junior College
BS Fitchburg State College

JOHN YOUNG, III
Staff Assistant, Sports Information
BA Marist College. 1986

Treasurer

MICHAEL T. RIVARD
Treasurer
AA Worcester Junior College
BS Boston University
MA Anna Maria College. 1966

EDWARD F. LEARY
Staff Associate
BS in BA Boston University
MEd Fitchburg State College. 1971

MARY L. LEARY
Staff Associate
AA Mount Wachusett Community College.
BS Fitchburg State College. 1972

DAVID SLARSKEY
Staff Assistant
BS Bentley College. 1985

Facilities

STEVEN LANCIANI
Director of Facilities
BS Lowell Technological Institute. 1983

ARTHUR W. TRENOWETH
Staff Associate, Facilities
AA Northshore Community College
BS Salem State College. 1982

DANIEL P. McLAUGHLIN
Staff Assistant, Director of Security
BA Boston College
MA Boston College. 1987

Faculty

ADDORISIO, Rose Ann
BSEd Fitchburg State College
MEd Fitchburg State College
Assistant Professor,
McKay Campus School. 1969

AGWARAMGBO, Lovell O.E.
BS Virginia Union University
MS Howard University
Assistant Professor
Chemistry. 1987

ANDERSON, Neal
AB University of Utah
MS University of Utah
PhD Cornell.
Professor, Biology. 1970

ANDREWS, James
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Industrial Technology. 1975

ANDRUSAITIS, Benjamin
BS University of Lowell
MS Northeastern University
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ANGELINI, Joseph A.
AB Providence College
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Associate Director of Admissions and
Assistant Professor, Mathematics. 1958

ANTAYA, David
BS University of Massachusetts
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Assistant Professor, Physical Education.
1981

ANTTILA, Faith
Massachusetts Professional
Librarian Certificate
Library Associate. 1966

ARCHAMBAULT, Raoul III
BS State University of New York, Albany
MA Central Michigan University
Assistant Professor, Military Science. 1987

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BS Worcester Polytechnic Institute
MS Worcester Polytechnic Institute
Assistant Professor, Computer Science. 1986

ARES, Henry
BA University of Moncton (Canada)
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McKay Campus School. 1970

ARNOLD, Lawrence
BA King's College
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PhD Trinity College (Dublin)
Professor, History. 1968

ARSENAULT, Elmer
BS Tufts University
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ARYEE, Augustine
BA Northeastern University
MA Northeastern University
PhD Boston University
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BABICH, George
BA Atlantic Union College
MS Loma Linda University
MS University of New Hampshire
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Associate Professor, Biology. 1978

BANNON, Lillian
BS Nursing Ed Boston College
MEd Boston College
MA Assumption College
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BARBARESI, Patricia
BS Fitchburg State Teachers College
Ed Fitchburg State Teachers College
MA University of Connecticut
PhD Cornell University
CAES Boston College
Professor, Education. 1965

BARBATO, James
AB Assumption College
MA Clark University
PhD Boston University
Professor, Geography. 1972

BARKER, William
AB Boston University
MA Brandeis University
PhD Brandeis University
Professor, English. 1971

BATTINELLI, Thomas
AA Boston University
BS Boston University
MEd Boston College
EdD Boston University
Chairman and Professor,
Physical Education. 1960

BECHIS, Donna
BFA Hunter College
MFA University of Pennsylvania
Professor, Art. 1974

BENTLEY, Robert
BA Wayne State University
MA Wayne State University
Assistant Professor, Mathematics. 1977

BERNSTEIN, Alan
BA Hofstra University
MA University of New Hampshire
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Professor, Psychology. 1969

BESNIA, Howard
AB Clark University
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ASA Society of Actuaries
PhD Clark University
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BOGOJAVLENSKY, Ann
AB Mount Holyoke College
MA Columbia University
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Business Administration. 1980

BOHRER, George F.
BA SUNY at Fredonia
MAT Keene State College
Assistant Professor,
Communications Media. 1985

BOISVERT, Dorothy
BS Merrimack College
MEd University of Lowell
Assistant Professor, Biology. 1983

BOND, George
AB Dartmouth College
MS University of Rhode Island
PhD University of Rhode Island
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BORG, Carla
BA West Virginia Wesleyan College
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BOURSY, John
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BOWERS, William
BSEd Eastern Michigan University
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BRADY, Michelle
BSN Boston University
MSN Boston University
Instructor, Nursing. 1976

BREEN, G. Jefferson
AB Clark University
MA Clark University
EdD Clark University
Associate Professor, Psychology. 1971

BROWN, William
BSGE University of Omaha
EdM Boston University
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Associate Professor,
Computer Science. 1972

BUCHOLC, Stanley
BA Glassboro State College
MA W. Virginia University
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BUDZ, Judith
BA University of Michigan
MA Tufts University
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MBA Clark University
Professor, English. 1974

BURKE, John
AB Boston College
AM Fordham University
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Chairman, Humanities Department and
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BURKE, Michael
BS State University of New York at Albany
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Instructor, Computer Science. 1984

CAGGIANO, Diane P.
AA Cape Cod Community College
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Assistant Professor, Business Administration.
1983

CAREY, David A.
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Assistant Professor, Business
Administration. 1980

CARSON, Norman
BS State University College of New York at Brockport
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Chairman and Assistant Professor, History. 1964

CASASSA, Eugene
BSEd Fitchburg State College
MA Columbia University
Assistant Professor, Speech. 1958

CASE, George
BA College of Wooster
MA University of Massachusetts
Assistant Professor, English. 1964

CASEY, William
BS Boston College
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MS Simmons College
Librarian. 1967

CHAMPLIN, Robert
BS Bridgewater State College
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PhD Ohio State University
Professor, Geography. 1972

CHARLAND, Sylvia
BS University of Massachusetts
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Instructor, Business Administration. 1984

CIOTTONE, Judith L.
BS College of St. Elizabeth
MA Clark University
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Assistant Professor, Chemistry. 1982

CLARK, John
BA American International College
MA Clark University
Assistant Professor, History. 1962

CLARK, Robert W.
AB Brown University
MEd State College at Bridgewater
MA Rutgers University
Assistant Professor, Mathematics. 1967

COLBERT, James, Jr.
BA Lateran University, Rome, Italy
MA University of Barcelona, Spain
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Professor, Philosophy. 1982

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BSEd Fitchburg State Teachers College
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Director, Student Records Registrar and Instructor. 1959

CONE, Linda
BSA Fitchburg State College
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Assistant Librarian. 1980

CONLIN, James
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Assistant Professor, Business Administration. 1982

COPOULOS, Nicholas
BS Boston University
MEd Boston University
Assistant Professor, Mathematics. 1957

COSGROVE, Christine
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CUNNINGHAM, Lee N.
BS Springfield College
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MEd University of Massachusetts
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CUSACK, Martin
AS Bentley College
BBA Northeastern University
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CPA
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CZAPRAN, Elizabeth
BS University of Massachusetts
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DECESARE, Richard
BS Holy Cross College
MA Boston College
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DECHENE, Lucy I.
BS University of San Francisco
MS University of California at Riverside
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Associate Professor, Mathematics. 1978

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BA Universidad del Valle
MA Syracuse University
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DICK, Stanley
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MA Harvard University
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Chairman and Professor, Biology. 1971

DONKOR, Alex
BS Norfolk State University
MS Old Dominion University
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Assistant Professor, Economics. 1986

DOWNEY, Joyce
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EdM Boston University
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Physical Education. 1968

DOYLE, Virginia
BS Boston College
MSHA Catholic University of America
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DRISCOLL, Rita
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DUFAULT, John
AB Assumption College
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FARIAS, Joseph
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FINKEL, Joseph
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FREEBURG, Donald
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Associate Professor, Art. 1961

GARD, Barbara J.
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GARVIN, E. Arthur
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GASKINS, Leonard
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GIOVINO, Rosemarie
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GLIDEWELL, Richard
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HINES, Leo
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JAMES, George B.
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JEFFKO, Walter
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Computer Science. 1979.

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Chemistry, 1985

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Business Administration. 1983

KEOUGH, William
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KIMMEL, Allan
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Assistant Professor,
Psychology. 1986

KING, Mary A
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Human Services. 1980

KINGSLEY, Howard
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KRANE, Stanley
BS City College of New York
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BS in Ed Boston University
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Physical Education. 1966

KRUSE, Richard
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CAGS Boston University
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Instructor,
Communications Media. 1985

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BS Fitchburg State College
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Instructor, Computer Science. 1984

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LAPIERRE, Theodore
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Professor, Computer Science. 1961

LAYTIN, Peter
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Communications Media. 1977

LEE, Robert R.
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DEd Harvard University
Professor, Education. 1970

LIGHT, Barry
BA Lebanon Valley College
MA Louisiana State University
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Chairman and Professor,
Mathematics. 1973

LORENZEN, Louis
BSEd Bowling Green State University
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MATFA Assumption College
MFA Syracuse University
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McKay Campus School. 1965

McALOON, Joseph
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MBA University of South Dakota
MSPA University of Massachusetts
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McANDREW, Claire
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EdD Lehigh University
Assistant Professor, Mathematics. 1983

McCABE, Donna-Lee
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MEd Boston University
Assistant Professor, Psychology. 1970

McCAFFREY, Marilyn
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MA Brown University
EdD Boston University
Professor, English. 1971

McGRAIL, John
AB Holy Cross College
AM Boston College
Assistant Professor, English. 1963

McGUIRE, Robert
BA St. John Fisher College
MS University of Kentucky
PhD University of Rochester School of Medicine and Dentistry
Associate Professor,
Computer Sciences. 1982

McKAY, Linda
BSN St. Anselm's College
MS Russell Sage
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McKEON, John J.
ABA Worcester Junior College
BS Southern Illinois University
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Assistant Professor,
Business Administration, 1979

McSHEEHY, Bruce R.
AA Worcester Jr. College
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Program Area Chairman. 1979

MACRIDES, Patricia
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MA Northeastern University
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MADDEN, Barbara Power
BS Boston College
MS Boston College
EdD Northeastern University
Chairman and Professor, Nursing. 1979

MALONEY, David
BS Worcester State College
MA Assumption College
CAGS Assumption College
EdD Clark University
Professor, Psychology. 1970

MANESS, Larry
BS University of Kansas
MFA Goddard College
Instructor,
Communications Media. 1985

MANEY, Elizabeth
BSEd Boston University
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Assistant Professor,
McKay Campus School. 1958

MARKHAM, Frank B.
BSM Embry Riddle University
MBA Troy State University
Assistant Professor, Military Science. 1984

MARTENS, Edward
BS Massachusetts Institute of Technology
MS Massachusetts Institute of Technology
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MAY, Anne
BSEd Fitchburg State College
EdM Boston College
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Special Education. 1956

MAY, Barbara
BS Boston College
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MS Boston University
Assistant Professor, Nursing. 1974

MAY, Elizabeth
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MS Boston College
Associate Professor, Nursing. 1970.

MELVIN, Harold
AB Harvard College
BD Episcopal Theological School
STM Harvard University
ThD Boston University
Professor, Sociology. 1970

MERRIAM, George
AB Clark University
AM Brown University
PhD Clark University
Professor, History. 1965

MICCICHE, Pasquale
BS Boston College
AB Boston College
MEd Boston College
MA University of Minnesota
PhD Boston University
Professor, History. 1969

MILLER, George
BA Eastern Michigan University
MA Eastern Michigan University
PhD University of Michigan
Associate Professor and Department Chair, Education. 1972

MILLER-JACOBS, Sandra
BA Queens College
MEd Boston University
EdD Boston College
Associate Professor,
Special Education. 1974

MINASIAN, Jane
BS Boston University
MS Boston University
CAGS Assumption College
Assistant Professor, Nursing. 1975

MIRANDA, M. Irene
BSEd Bridgewater State College
MA University of Massachusetts
Assistant Professor, English. 1965

MOON, John E.
AB Harvard College
MA Columbia University
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MORELAND, Hattie
BS Prairie View A&M College
MA University of Minnesota
CAGS University of Minnesota
EdD Boston University
Associate Professor,
Special Education. 1977

MORIARTY, William
BS Bentley School of Accounting and Finance
MBA Suffolk University
CPA
Assistant Professor,
Business Administration. 1983

MORRISON, Francis D.
AB University of Massachusetts
JD Boston College
Assistant Professor,
Business Administration. 1979

MRVICA, Ann R.
BAA Ryerson Polytechnical Institute
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Assistant Professor,
Communications/Media. 1984

MURPHY, Caroline
AB Regis College
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Professor, Economics. 1971

MURPHY, George
BS in Business Administration
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Business Administration. 1976

MURRAY, Thomas
BA Iona College
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Assistant Professor, English. 1986

NEUNHERZ, Rose Marie
BS Beaver College
MS Southern Connecticut State College
MS Northeastern University
Professor, Biology. 1967

NOLE, Barbara
BSEd Bridgewater State College
MSPE University of North Carolina
Assistant Professor,
Physical Education. 1970

NOONAN, James
BS Suffolk University
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NORTON, Donald
BA University of Connecticut
MA University of Connecticut
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Professor,
History and Political Science. 1969

OBERMEYER-SIMMONS, Helen
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Communications Media. 1981

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CAGS Boston University
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Associate Professor, Education. 1971

O'MALLEY, Alice T.
BA Anna Maria College
MA Clark University
PhD Clark University
Associate Professor, Biology. 1965

O'NEILL, Eileen
BS Fitchburg State College
MSN University of Massachusetts
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OUELETTE, Janice A.
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OVIAN, Lawrence A.
AB Bates College
EdM Pennsylvania State University
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Professor, Industrial Technology. 1971

PALLY, Erwin
BA University of Massachusetts
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AM Harvard University
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Professor, English. 1966

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PATTERSON, Frank
BA Trenton State College
MM Temple University
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Associate Professor, Music. 1968

PHELPS, Edson H.
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BS Clark University
MEd Fitchburg State College
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Assistant Professor,
Industrial Techology. 1979

PICARD, Carol
BS Fitchburg State College
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Instructor, Nursing. 1981

QUIGLEY, Lawrence
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Professor, English. 1968

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RAPP, Donald
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RATNEY, Tanya E.
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1986

ROBINSON, Daniel
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1977

RODER, Beverly
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MS Tufts University
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ROSS, Elizabeth
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Education. 1971

SCHMIDT, Donald
BA State College of Iowa
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SCHONBECK, Harold
BS University of Connecticut
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Business Administration. 1977

SEMERJIAN, Harry
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SGAN, Mabel L.
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SHAUGHNESSY, Robert
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Computer Science. 1966

SHAW, Elizabeth
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STRADER, William
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1986

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Industrial Technology. 1985

TAPPLY, Robert
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THOMAS, Edmund
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TOWER, Cynthia
BA Western College for Women
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Human Services. 1978

TRIFILO, Richard
BA Fitchburg State College
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TURK, Michael
AB Princeton University
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VALANEJAD, Esmail
BS University of Birmingham (England)
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Chairman and Professor, Physics. 1968.

VINSKEY, Mildred
BS Worcester State College
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BS University of Massachusetts
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Political Science. 1983

WALLEN, Andrea
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WELCH, Robert
BS Emerson College
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WELLENS, Charles H.
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BS Western Michigan University
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CONSOLATTI, Gail
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GIMBEL, Katharine
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KRESSY, Jean
BS Columbia University
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MAC DONALD, Barbara
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MAC LEAN, Marianne
MS Boston College
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CONDIKE, George
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COX, Catherine
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HARROD, Walter F.
EdM Professor Emeritus of Industrial Arts

HASKINS, Elizabeth M.
MS Professor Emerita of Mathematics

HOBBS, Alfred
EdM Professor Emeritus of Industrial Arts

HOFFMAN, Ruth F.
BS Professor Emerita

KENT, Richard
DMA Professor Emeritus of Music

KOEHLER Everett E.
AM Professor Emeritus

KRAWIEC Bernice M.
MS Professor Emerita of Nursing

LANDALL, Lawrence
BS Professor Emeritus of Industrial Arts

LENAWAY, Sr. Mary Albert
PhD Professor Emerita of Education

LEONARD, A. Orin
EdD Professor Emeritus of Psychology

LYSTILA, Doris V.
MEd Professor Emerita of Education

McDOWELL, Margaret M.
MEd Professor Emerita of Education

McMURRAY, Philip A.
EdM Professor Emeritus of Education

O'CONNOR, M. Elizabeth
MEd Professor Emerita of Education

PHILLIPS, Belle Nixon
EdM Professor Emerita of English

ROACHE, Mary L.
EdM Professor Emerita of Education

SEHL, Katherine N.
EdD Professor Emerita of Nursing

SIMMONS, Anna G.
AM Professor Emerita of Geography

SIPILA, Signe Antila
EdM Professor Emerita of Education

STEFFANIDES, George F.
EdM Professor Emeritus of Biology

TATER, Lillian
EdM Professor Emerita of English

THOMAS, Rene
MEd Professor Emeritus of Industrial Technology

Parking Regulations

Parking facilities at Fitchburg State College are limited, but have been gradually expanded to over 1,100 cars.

All vehicles utilizing the parking facilities at Fitchburg State College must display the proper identification sticker. Stickers may be purchased at the Campus Security office located in the Power Plant Building.

Students residing in campus-owned residence halls are not permitted to bring a motor vehicle to campus unless their academic program requires the use of such.

More specific information can be found in the booklet entitled "Motor Vehicle Regulations."

Animals on Campus

Due to health and safety considerations, no animals can be allowed on campus or in campus buildings at any time. Only exceptions are seeing-eye dogs and laboratory animals.

Massachusetts Trespass Act

Fitchburg State College is governed by the Massachusetts Trespass Act, enacted June 2, 1969.

Trespassing Upon the Land of Certain Institutions

Whoever willfully trespasses upon land or premises belonging to the Commonwealth, or to any authority established by the general court for purposes incidental to higher education after notice from an officer of any of said institutions to leave said land, remains thereon, shall be punished by a fine of not more than $50 or by imprisonment for not more than three months.

Buildings and Grounds

The 90-acre campus includes academic buildings, an administration complex, three residence halls, an apartment residence complex, the library campus center, an auditorium theater, a dining commons, and gymnasium. A short distance north of the campus is a 36-acre athletic and recreational area and the McKay Campus School, a cooperative laboratory facility involving college education students and elementary children. The College also owns a 120-acre conservation area located in three neighboring communities.

Anthony Building, 1936
Named for Willis B. Anthony, Director of the Industrial Arts Department, during the period 1909-1947. Serves as a warehouse and supply distribution center, and houses Health Services, the Grounds Department, the Office of the Athletic Director, and ROTC.

Aubuchon Hall, 1966
Named for William E. Aubuchon, Jr., Trustee of the Massachusetts State College System, 1965-1974. A residence hall for 380 students.

John P. Dupont Facilities Building, 1978
Located on the west side of the campus quadrangle. Houses the office of the Director of Facilities, the power plant, and Campus Security.

Condike Science Building, 1963
Named for Dr. George F. Condike, professor of Chemistry 1947-1982 and Academic Dean 1954-1956. Houses the offices of the Vice President for Academic Affairs and the Undergaduate Dean and the following academic departments: Biology, Chemistry and Medical Technology.

Conlon Building, 1976,
Named for Florence Conlon, professor, 1920-1961. Houses the offices of the Humanities Department, including the Art, Music and Philosophy faculties, the Industrial Arts Department, the Communications/Media Department, the photography laboratories and the television studio.

Edgerly Hall, 1900
Named for Joseph G. Edgerly, Superintendent of Schools in Fitchburg, 1875 to 1914. Contains the Data Processing Center, and the Computer Science Department.

Hammond Building, 1975
Named for James J. Hammond, Instructor and Commonwealth Professor, 1937-1962; President, 1963-1976; Chancellor of the Massachusetts State College System, 1976-1981. Contains the Campus Center, Library, Career Services, Counseling Services, Learning Resource Center, the Fitchburg State College Film Library, and the A.I.D. office.

Herlihy Hall, 1957
Named for Charles M. Herlihy, Principal, 1927-1932 and President, 1932-1944. A coed residence hall for 142 students.

Holmes Dining Commons, 1973
Named after Roger Franklin Holmes, Professor of History from 1928 to 1969.

McKay Campus School, 1971
Named for Edith McKay who in 1950 donated ten acres of land to the City of Fitchburg. Besides being a campus laboratory school, the McKay Campus School contains the offices of the Departments of Foreign Languages, Early Childhood, Elementary, Secondary, and Special Education, Geography Earth Science, Physics, and the Business Administration Departments.

Miller Hall. 1903
Named for Joel D. Miller, a Massachusetts State Senator, 1894-1897 and member of the State Board of Education, 1895-1909. Contains the English, Speech, Mathematics, Social Science faculty offices, and The Fitchburg State College Education Association.

Newman Center, 281 Highland Avenue
Owned by the Worcester Roman Catholic Diocese. The Center for the Newman Association. Includes an ecumenical chapel, a lounge for studying and socializing, a kitchen and recreation room for all students.

Parkinson Gymnasium, 1957
Named for William D. Parkinson, principal from 1920 to 1927. Contains offices and classrooms of the Physical Education Department.

Percival Hall, 1909
Named for Harry F. Percival, professor, 1931-1953. Houses the Behavioral Science Department, including the Psychology, Sociology and Human Services offices.

Russell Towers, 1971
Named for Dean Helen Ross Russell, Professor 1949-1966. A coed residence hall for 405 students.

Sanders Administration Building, 1963
Named for William J. Sanders, President 1945-1950. Contains the offices of the President and his support staff, including the Community Relations personnel. The Vice President for Student Services, the Treasurer, the College business office, Financial Aid, Registrar, Admissions and the Dean of Graduate and Continuing Education are also housed in the Sanders Building.

Thompson Hall, 1895
Named for John C. Thompson, principal 1895 to 1920. Houses the offices of the Nursing Department, and the Advising Center.

Town House Complex, 1978
A 7-building complex, which provides apartment style units for groups of 5, 6, or 7, with a separate bedroom for each member of the group. The apartment buildings are coed, but the sub units in the building are not. The complex has two apartments designed for the handicapped.

Weston Auditorium, 1959
Named for President Ralph Weston who was Instructor in Math; Dean of Men, 1938-52; and President of the College, 1953-63. Weston Auditorium seats 800 people and is used for lectures, live entertainment, movies, and classes.

Academic Glossary

Baccalaureate The Bachelor's Degree; traditional first step on the ladder of higher education. It is characterized by a four-year program which blends courses aimed at promoting the acquisition of broad knowledge through General Education (historically, the liberal education) with courses designed to give depth of understanding in the major field.

Carnegie Unit The unit of work expected of students for each college credit. The College expects students to spend 45 hours of work for each credit. The most common break down for one credit is one hour of class work and two hours of homework for fifteen weeks each semester. A three-credit course demands nine hours of work each week.

CLEP The College Level Examination Program by which up to 60 semester hours of credit may be earned towards the degree. For details, see, "Alternative Programs."

College Style Manual Standard The Modern Language Association Style Manual is the official standard for the College. Except wherein a Program or Department has specifically designated some other standard as more relevent to its Field, composition shall adhere to the official standard.

Credits Arithmetic representation of the value of completed course work towards the degree requirements. One classroom hour and two hours of homework for the nominal fifteen-week semester usually counts for one credit. As the usual course responsibility requires three classroom hours per week, per semester, and six hours of work per week outside the classroom, the normal yield per course is three credits. Tradition and practice in the case of laboratory, studio, shop and other practica awards proportional credit for hours of attendance.

Department An administrative subdivision of the faculty. Sometimes the department is identical with a discipline category such as English or Mathematics. Departments such as Behavioral Sciences, Humanities, and Social Sciences represent an association of faculty members of related disciplines.

Electives Those course selections by the candidate which are not predetermined by graduation, Major or Minor requirements.

General Education Befitting the Baccalaureate tradition and current practice, the Fitchburg State College candidate is

required to complete a minimum of 60 credits in a distribution of courses involving the sweep of liberal arts disciplines at the College. For details, see, "General Education."

Major That structured experience in an academic field which constitutes the candidates's specialization. All degree programs require a Major; there are three options open. As considerable variation exists as to prerequisites and total credits, the candidate must carefully study the structure of the Major of her/his choice. For details of Major requirements, see, "Courses and Programs..."

Minor That structured experience in a related Discipline/Field which is recognized by the Major Department as supportive of the candidate's specialization. Minors are defined by the Academic Department offering them. As considerable variation in requirements exist, the candidate should study carefully the Minor offerings, see, "Courses and Programs..."

Prerequisite Those courses which must be satisfactorily completed before admission to certain other courses. Prerequisite courses are listed in the course description of the course requiring them. Again, see, "Courses and Programs..'

Program That construct of General Education, Major, Minor, and/or professional courses which satisfies the requirements for a particular degree.

Self-Help Self-Help is in the form of loans and work.

Style Manual The Modern Language Style Manual for writing is the official style manual for Fitchburg State College unless modified by individual departments for needs particular to their discipline.

Track That subdivision of academic programs which constitutes a unit of professional competence. Suggestive of the complexity of identifications involved in only one Department, consider the example of Business Administration. This program includes tracks in Accounting, Management, and Marketing. The candidate should clarify with his/her advisor and Major Department the track which he/she is interested in pursuing.

Waiver of Regulations Recognizing the inappropriateness of rigidity in endeavors to promote its goals, the College provides for waiver procedure relative to its baccalaureate rules, regulations and programs. All petitions for waiver of regulations begin with the Office of the Undergraduate Dean. The student should note that reasons for waiver must be as exceptional as the grant.

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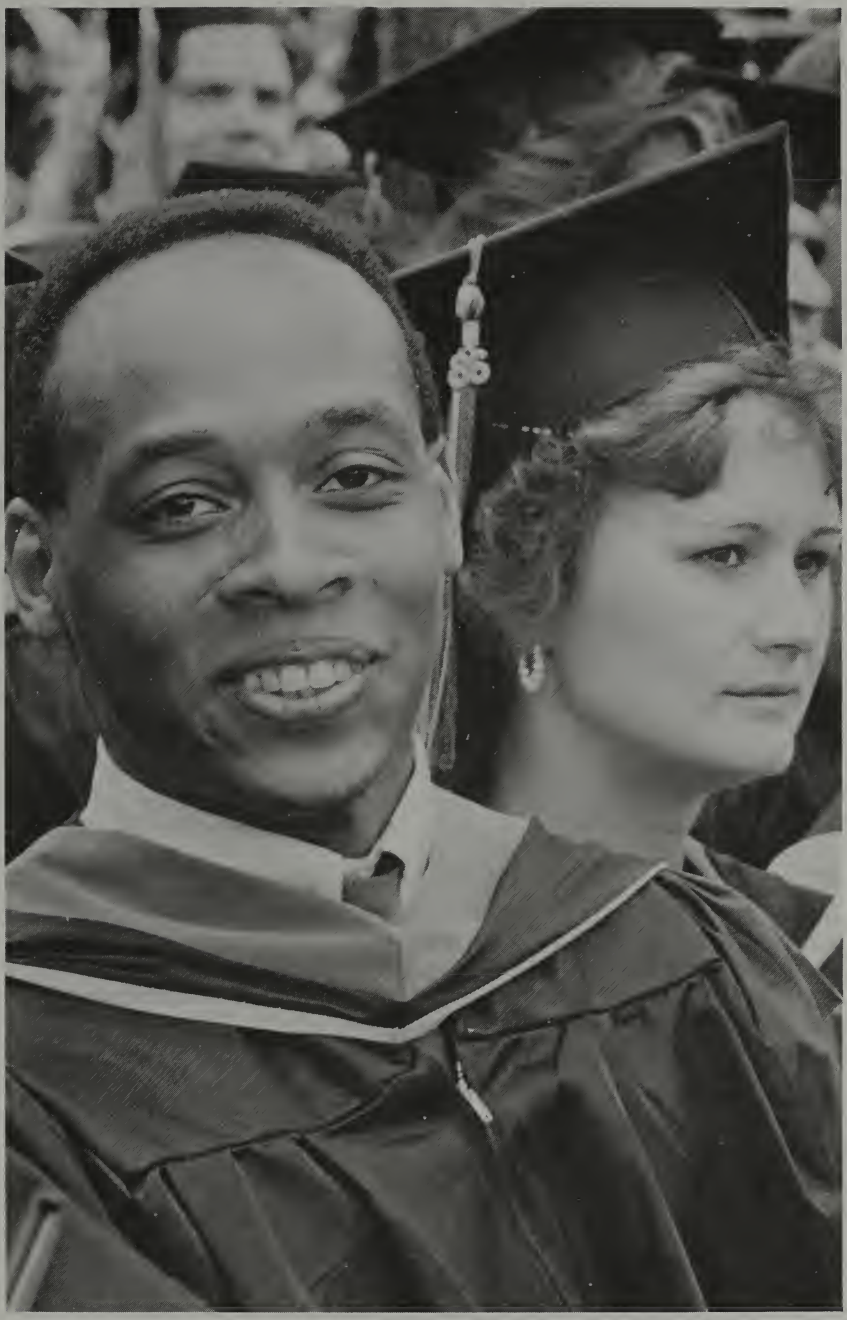

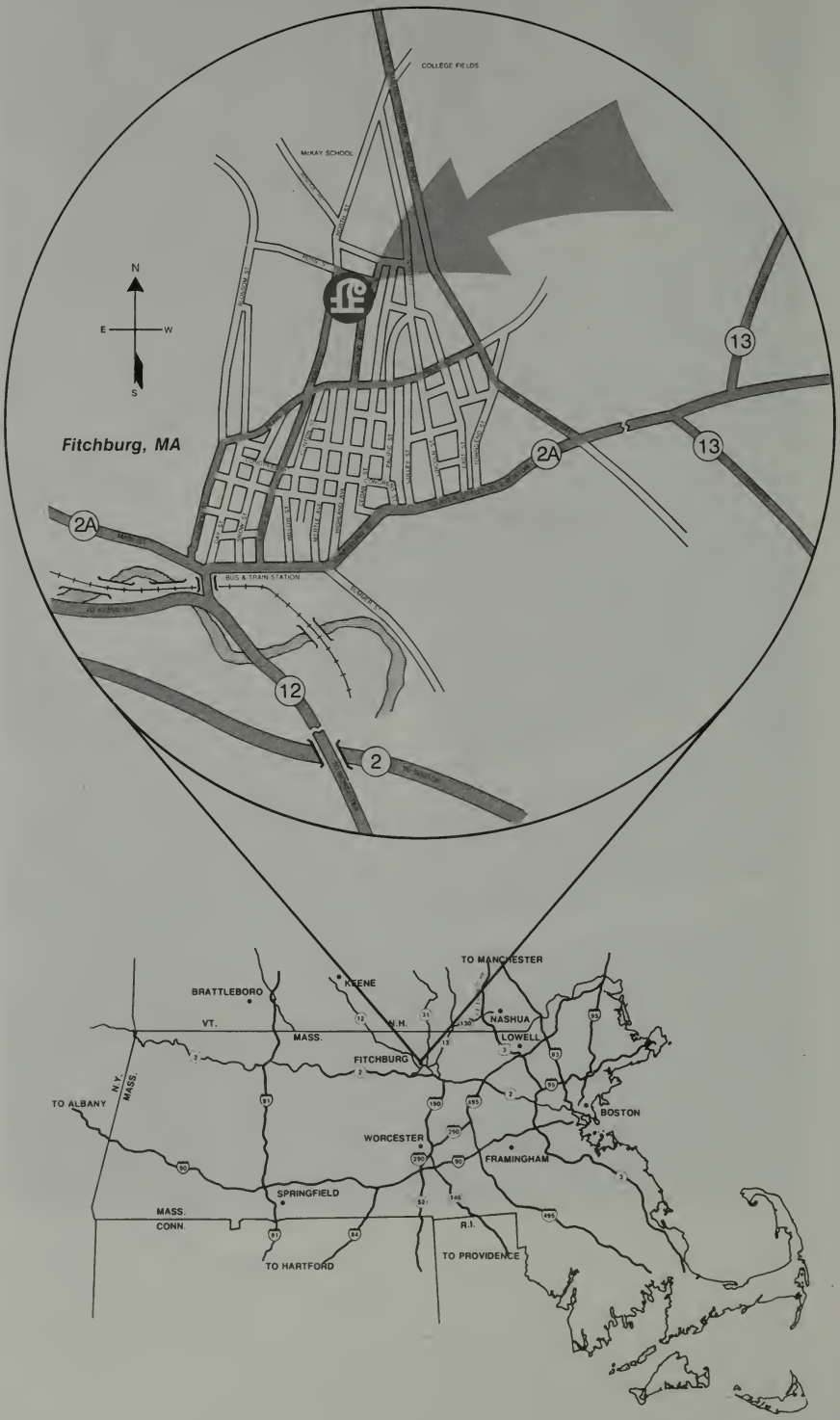
COLLEGE FIELDS
McKAY SCHOOL
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BUS & TRAIN STATION
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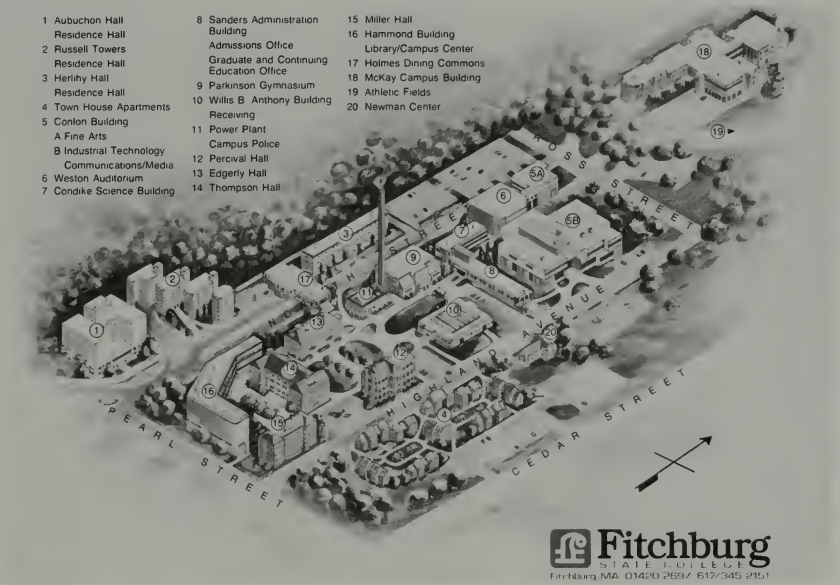
TO MANCHESTER
KEENE
BRATTLEBORO
VT.
N.H.
MASS.
NASHUA
LOWELL
FITCHBURG
N.Y.
MASS.
TO ALBANY
BOSTON
WORCESTER
FRAMINGHAM
SPRINGFIELD
MASS.
CONN.
R.I.
TO HARTFORD
TO PROVIDENCE

Directions to Fitchburg State College



Fitchburg State College is located in a residential section of Fitchburg, the urban center of North Worcester County. It's approximately 25 north of Worcester, 50 mile west of Boston and 15 miles south of New Hampshire. The compact campus of 24 building on 48 acres is easily accessible by car, bus or train from all areas of New England.

By car:

From within Massachusetts: Take Interstate 91, 190 or 495 to Rte. 2 to Rte. 13 exit. Follow Rte. 13 north (toward Lunenburg) to Rte. 2A (about 4 miles), then take a left toward Fitchburg. At the intersection of 2A and the John Fitch Highway (about 1¼ miles), turn right, pass through a set of blinking lights and, at the next stop light, turn left on to Pearl Street. The college is located about ¼ mile up Pearl Street.

From New Hampshire: Take Rte. 12, 13 or 31 to Fitchburg. Follow city map insert.

From Connecticut: Take either Interstate 91 or 84 to the Massachusetts Turnpike, exiting north on to Interstate 290 in Auburn. Follow 290 to Interstate 190 north to Rte. 2, exit on to Rte. 13 north and follow directions given above for Massachusetts locations.

From Rhode Island: Take Rte. 146 north to Interstate 290 through Worcester exiting onto Interstate 190. Follow instructions for Massachusetts locations.

By bus or train:

Daily MBTA trains to and from Boston stop on Main Street in Fitchburg. Cross Main Street to North Street. The college is three blocks north. See map insert.

Trailways buses from Pittsfield, Springfield and Worcester also stop on Main Street near the MBTA Station. Follow walking directions above.

Buses from Boston stop at the intersection of Rtes. 2 and 12. Cab or local bus service to the college is available from that stop.

If you have any questions, please call 617/345-2151

Fitchburg
STATE COLLEGE
160 Pearl Street
Fitchburg, MA 01420-2697

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